COAL AGE

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The Company or the Department—Which?

The purpose of this query is to set mine officials thinking as to whether in doing their day's work they are considering first the company's good or just the cost sheet and production figures of their own department.

THE "big boss" of a corporation can help answer this question, because he shapes the policies for all the departments—and then sometimes forgets to see that they are uniformly followed.

Consider some of the ways in which the truth of this assertion is demonstrated:

First:

Coöperation in the purchase and use of material.

Mine No. 1 lays a long line of 6-in. pipe. A quantity of the pipe and fittings is left over. Six months later No. 2 mine of the same company needs some pipe, but the foreman of this latter mine won't use the pipe from No. 1 plant unless the price is reduced to a figure based on the cost of second-hand material.

To reduce the cost of the pipe means a charge against No. 1 mine, and the foreman of that plant won't stand for such an arrangement. The No. 2 foreman therefore orders new pipe and gets it. As a consequence, the company owning both mines spends money for something it doesn't need.

The point is that a good mine foreman should know that whenever he needs material which the company has on hand **anywhere** and which it hasn't agreed to scrap, that material should be used. The executive who fails to see that such a plan is followed is not doing his best for the corporation he serves.

Second:

Employing Men.

It should be the fixed policy of every concern when someone is needed for a job to see that the best available man is hired. Most corporations insist that creeds "cut no ice" in the employment of men; yet one department in that company will be all Catholic and another all Protestant, depending on how the head of the department leans.

Third:

Policies affecting conditions of work, pay and promotion.

But few companies have reached the point where policies of this character are uniform. We all agree that safety first should apply to all departments; then so should all other conditions of work.

Consider especially pay and promotion. To the man in the accounting department it seems that nearly all mining engineers become superintendents, while to the engineer it seems easy for a coal-mine clerk to become auditor or treasurer. But why do clerks performing the same kind of work get more in one department than in another? Perhaps the pay in some departments is out of line. If so, the "big boss" should step in and bridge the gulf.

Lack of uniformity is illustrated in still other ways: One man can buy all the new material he needs, from office furniture to lead pencils. Another department head must produce results with the obsolete equipment on hand. A third official is permitted to own an interest in a neighboring coal mine, while a fourth department head is reprimanded for taking subscriptions, on the side, for a magazine. One man can turn in any old kind of expense account, while another literally has to make an affidavit to get an O. K.

Get This:

Every mining man should remember that he is working first for his company and second for his department.

If laboring along this line doesn't get one ahead and insure appreciation, then that man is serving a corporation founded on a policy that will not clothe his future in a mantle of gladness.

Ideas and Suggestions

Two Straws

By George N. Lantz*

Straws thrown in the air show which way the wind is blowing. A phrase or an act gives an insight into a man's character. So also do the minor incidents at the mine show us which way we are drifting. Two such occurrences I will relate:

Said a certain miner from a nearby mine: "The boss pulled off one today that takes the bakery. We run out of orders at noon, and the weighboss mine-a-phoned the super. Then Dick took the line to ask if there would be anything doin' this afternoon. We could hear the super saying, 'Are the other fellows there?' And Dick says, 'Yes.' And then the super says, 'You stick around till they leave and then go to the shop; I've got a job for you there.'

"Now I ain't kickin' because Dick got to work, and we didn't. What I don't like is the [censored word] underhand way he and the boss arranged things. We all know Dick is a good man and can do lots of jobs better than we can. And we ain't jealous, and we don't get sore as long as they frame up their jobs in the open. But if they gain anything by pullin' off stunts like that, I don't know what it is."

Said a miner from another mine: "The boss got a lot of things off his chest today. You see, tomorrow is an idle day, and some of the fellows had been kickin' on account of extra work. The boss showed up at noon. He got there rather late, but when the whistle blowed, he kept right on talkin' till he'd said his little say. He told us that he understood our position; that he knew we needed the work and that our families needed the money, and he said that he knew how a couple of days helped out when the mine is running less than half-time, the way it has been for the last month or two. Then he gave us the price of coal and how much royalty the company pays and their expenses, and showed us how much a ton our wages come to.

"After that he told us how he had to make the thing pay, or there wouldn't be work for none of us. And it sounded purty reasonable. Of course we all know there are two sides to every question, but how are we to know the other side if they keep their mouths shut tight as a clam.

Then the boss worked around to the extra-time question. He said he wanted Dan and Tony to work tomorrow. They're a little ahead of turn, but he's got a job that they understand better than we do and he can't be with 'em much, because he'll have a gang workin' somewhere else, and he has to be there. But he told us he'd keep us as near even as he could, and when any of us were behind turn, he'd fix it as soon as possible. Say! there's some satisfaction in workin' for a man like that. You get a kind of feelin' that he ain't meanin' to give you the worst of it."

After hearing these remarks I thought: "There's a lesson in this for mine foremen and superintendents."

Boss No. 1 will have some labor troubles on his hands some day when he least expects it, and forgetting the influence of little things, he'll look for a cause, with the result that after a self-satisfying self-inspection, he'll blame some labor leader or the "psychology of the mob."

Everything will run along smoothly for boss No. 2, and he'll avoid the difficulties of the other man without ever realizing that there were any difficulties to avoid.

Then I said, "I'll write an article for *Coal Age* on this subject," and this is it.

*New Straitsville, Ohio.

The Loophole in "Safety First"

By James T. Reynolds*

In reminding *Coal Age* readers that there is the possibility of much harm in the current safety-first propaganda, I wish to call attention to the fact that any slogan in itself is useless. Worse than that, it may be the indirect means of something pernicious. In making this statement I am prepared to expect and accept accusations of heresy.

But the truth remains that even so splendid a slogan as it is may serve as the cloak to cover a multitude of sins of omission. It should be amended in many instances so that every sign so placed as to be passed frequently by the men and boys it is intended to reach might call the workmen's attention not alone to the fact that safety should be his first consideration, but by terse yet pertinent addenda convey thought regarding that fact, such as the following:

"Thinking safety first will not eliminate liability of accidents unless you *practice* it!"

"Safety first means that *you stop* and think when about to take a risk which may endanger you or your comrades."

"Safety first will not save *you* unless *you* save yourself."

"Remember that safety first means that you think of those at home as well as yourself when about to do something which may endanger your life."

And for the mine official and employer one might suggest placards placed where the official eye could not escape them, and the official mind be ever reminded that—

"Filling your mine with safety-first signs and allowing certain conditions to exist which *you know* are a *menace* to the careless or indifferent workman is not practicing what your signs preach."

"Remember that safety first means *you* as well as the miner. You lead, he follows, and what you do in your way he'll do in his. Don't remind *him* that safety first means setting a prop when needed and let him see *you* taking a chance with too much coal dust and too little ventilation."

*Safety inspector, Houston, Penn.

And there should be a placard that both official and nonofficial may read as they hustle, such as:

"Don't put off until tomorrow what you know should be done today. Safety first means *do it now!* Tomorrow *may be too late!*"

Such signs, worded in several languages so as to be understood by all the workmen, would by their variety of text, which might be endlessly varied, compel thought. The eternal iteration of a too-brief phrase such as "safety first" becomes in time absolutely sterile. The mind, particularly of workmen not always largely given to contemplation, becomes dulled to its significance. Variety is the spice of safety suggestion.

Preparing for the New Year

By Pennsylvania Engineer

At this season most of us are preparing for the new year. In fact we prepare for the new year, consciously or not, during every day of the present year, for all that is done or left undone exerts its influence upon the future. However, now that the new year is right upon us, our planning or the lack of it is brought into sharper focus.

Our mining communities offer the opportunity—yes, they give rise to the obligation—to make additional plans. We cannot rest satisfied with any preparations for the new year that are limited to a consideration of operations alone. If our aim is to develop the highest efficiency in ourselves and others, we are obliged to pay attention to the human side. One phase of this part of our affairs is the question of public celebrations. Why should all of our holidays pass without any special observances?

There have been so many holidays established that it would be neither possible nor desirable to celebrate all of them. On the other hand there are perhaps four or five for which definite and active preparations ought to be made well in advance. With the exception of legal holidays the celebrations need not interfere with the regular work of the day, even though the general interest of the community be aroused by participation in the program.

Suggested Days to Observe

The following days suggest themselves as offering particular advantages for observation: Arbor Day, Fourth of July, Columbus Day, Thanksgiving and Christmas. In addition to these, or in place of some of them, other days of greater local interest could be included.

Arbor Day is generally celebrated in the schools, but interest in the day ought to be extended farther. You will doubtless find that your state forestry or agricultural department will be only too glad to assist you in preparing for the day. The state authorities could probably arrange to send a speaker to your community to tell about the planting, care and protection of trees, as well as to give advice in the selection of trees best adapted to a particular region. But if your plans are well laid, you will not rest satisfied with that alone. You will organize the young people of the community into a protective association to watch over the existing trees and to occasionally plant new ones. The healthy spirit of conservation thus brought out cannot fail to extend itself to prevent the waste and destruction of the inanimate property around the mines.

At present many places are neglecting opportunities because of lack of preparation for the Fourth of July. Instead of a meaningless individual celebration, would not the benfits to all be greatly increased by a general celebration participated in by the entire community? After all the real purpose of Fourth of July observances is to commemorate the independence of the nation. It is, then, a day that distinctly calls for more than individual celebration.

Mining towns will gain by following the example of certain cities in devoting an hour or two in the evening of Columbus Day to a declaration of the privileges and responsibilities of citizenship. Our mines are now worked by a large proportion of foreign-born men, many of whom are already citizens or applicants for naturalization papers. Columbus Day is well suited to the purpose of reminding them of their duties.

Thanksgiving affords opportunities for a review of the trials of the early settlers in this country compared with the comforts and luxuries of today. We may get even more happiness out of the day if we make intelligent and practical plans to develop the general interest of the town in the sick and needy on that day.

The community Christmas tree is a form of celebration that marks the growing tendency toward group interests as contrasted with individual plans. Scarcely any movement designed to stimulate neighborly goodwill is better adapted to our mining villages than this.

In preparation for these or other public events the details will have to be worked out according to local conditions, the aptitude of the people and their appreciation of the causes of the celebrations. Music, speeches, pamphlets, pictures, charts, exhibitions and decorations suggest themselves as valuable features.

Committees To Direct Preparation Work

The work of preparation may best be accomplished by carefully chosen committees. The work of the individual should be confined as largely as possible to initiating plans and the carrying out of one or more of the small details that go to make up the whole plan. The impression must be made clear and distinct that it is a community undertaking, not that of an individual.

Any public celebration, no matter how simple, will be a benefit to a community in direct proportion to the care taken and work done in its preparation. It is natural for everyone to look back upon any pleasant event in which he has taken an active part with a certain feeling of satisfaction. To create and maintain such a spirit in the place where we live ought to be the aim of all of us. This should especially be the case in our mining towns, which are usually more or less isolated units, where it is generally easier to enroll the entire population than it is in a city.

In preparing for the new year and in trying to realize its opportunities, those in authority in our mining towns may naturally be expected to take the lead. But leaders can do nothing without others who are ready and willing to back them up. There is a chance for everyone to make an effort to benefit his community in 1916.

If a man is caught stealing a lamp or a pick or any bit of mining material, no matter how trifling the value, he will certainly be discharged and may be sent to jail, but the same man may steal several dollars' worth of time and go scot-free—why the distinction?

Underwood--A Modern Colliery

By C. M. Young*

SYNOPSIS—Although the amount of anthracite yet remaining to be mined may be determined within close limits, better machinery and equipment than ever before are now being installed. The colliery here described is one of the newest as well as one of the most up-to-date in the entire anthracite region.

In the anthracite fields the latest is the best. We hear not infrequently that the anthracite industry is dying and that there is no progress in it. In a way the first statement is true, for it is possible to estimate with some accuracy the amount of coal still in the ground and to predict the end of profitable mining.

But in another sense the statement is far from true, and in this sense the anthracite industry is more alive now than ever before. The anthracite producers are more than ever responsive to the necessity for every possible economy of production and to the desirability of every possible means for the efficient cleaning and handling of the coal.

Thus, it is a fact that this "dying industry" is now being equipped with better apparatus and more attention is being paid to the economies of operation. It has been found that anthracite is not a substance that will "sell itself," but that it must fight for its market. To do so it must be well prepared and cheaply produced. Therefore, every new breaker is well equipped and fitted for handling coal with the minimum of breakage, and every new mine is planned for maximum economy.

*Scranton, Penn.

Underwood is the latest and the best of the collieries of the Pennsylvania Coal Co. It has had the best thought and attention of the company officials, and they are proud of it—with reason. This colliery is to handle a large body of coal lying on the east side of the northern anthracite basin, about 5 mi. northeast of Scranton and 18.8 mi. from the north end of the basin. The maximum thickness of coal at this point is from 25 to 30 ft., and the acreage is large, so that the colliery will probably be operated for 40 or 50 years. The problem set before the engineers of the company was the planning of a colliery that should take out the coal at the least possible cost, thoroughly prepare it at the lowest expense and extract from the ground every bit of available fuel. This last point deserves especial emphasis.

The coal measures here dip to the northwest at approximately 14 per cent., though some inclinations of 25 per cent. are found. The lowest bed on the property is the Dunmore No. 3, and the highest is the Rock or Checker. Of these Dunmore No. 3 and much the larger part of No. 2 do not outcrop on the property.

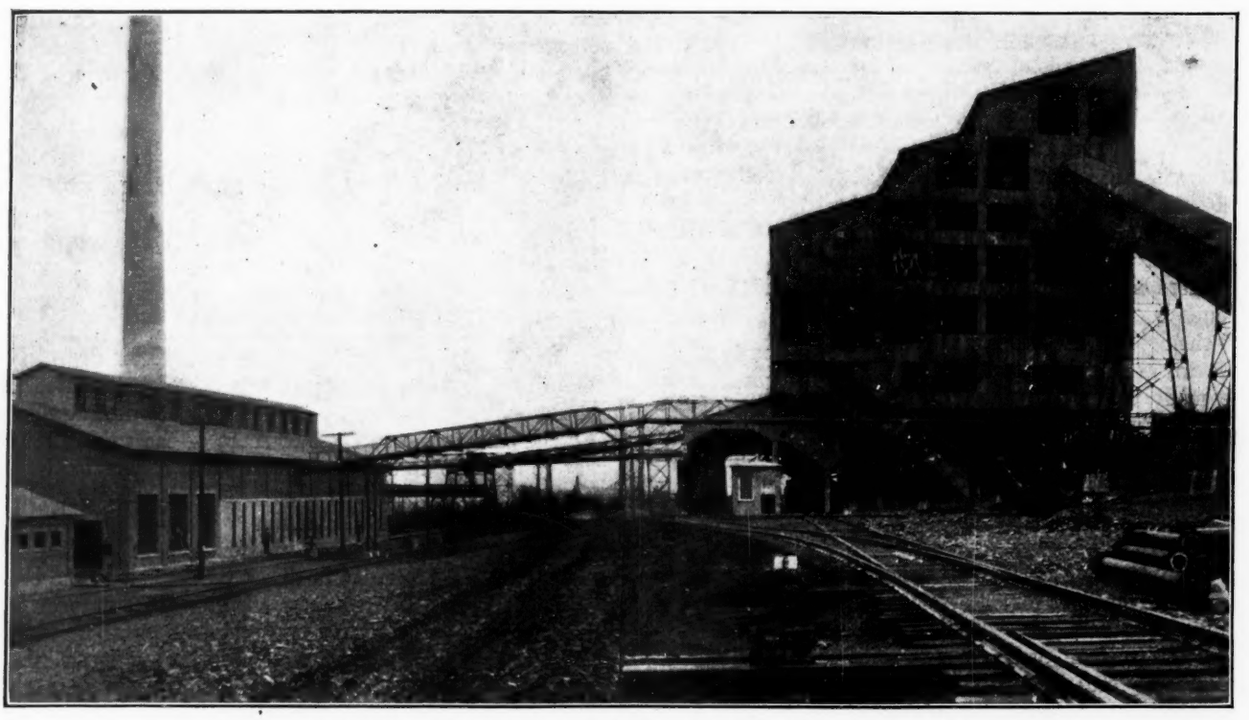

FIG. 1. GENERAL VIEW OF UNDERWOOD BREAKER AND POWER HOUSE

The surface plant is located between the outcrops of the Dunmore No. 1 and the Clarke beds. The No. 1, or main shaft, which has four compartments, is sunk to the level of Dunmore No. 2, at which level gangways are driven eastward and westward in the bed. From these chambers are turned to the rise. These will be driven as close to the outcrop as is considered safe, so that practically no coal will be lost here. A rock slope is driven to the same level from a point to the southwest about 1,000 ft. away. This is intended principally for hoisting rock and lowering timber, but it has a travel-

ingway and is now used as a manway. This latter use will soon be largely discontinued. This slope is 600 ft. long and has a grade of 25 per cent.

At the shaft bottom tunnels are driven to the Dunmore No. 3. on one side and the Dunmore No. 1 on the other. Loaded cars come in on the Dunmore No. 3 level and pass through this tunnel to the cage, while the empties go through the other tunnel to Dunmore No. 1. The loaded cars are brought by the locomotives to the Dunmore No. 3 level and left there to be carried to the shaft by gravity, while the locomotives go to the Dunmore No. 1 for the empties. This tunnel is 32 ft. wide, to accommodate the 4-track system. There is room on the bottom for 200 loaded cars. Tracks have a grade of 2 per cent. in favor of the loads for a distance of 500 ft. from the shaft on each side.

Number 2 shaft is driven to the Dunmore No. 2 bed about 300 ft. northwest from the main shaft. It is 230 ft. deep and has three compartments, two for hoisting and one for ventilation. It is the man and supply shaft. Another shaft, No. 3, is situated 2,400 ft. away to the northwest along the dip and is sunk to the level of the Clarke bed. Like No. 2 it has three compartments. It is intended for handling men and supplies, for ventilation and especially for a second opening in case of accident.

Arrangements at No. 1 Shaft Bottom

From the No. 1 shaft level in Dunmore No. 3 a slope is sunk on the bed, from which the lower levels of this bed will be worked out to the property limits. This slope will be about 4,200 ft. long. The top is good in this bed, and little timber will be needed. All the coal mined will be brought out through three slopes—Dunmore No. 3, Clarke and Pittston. The average grade of the slopes is 14 per cent. and the maximum 16 per cent.

From the west level, from the bottom of the main shaft, a rock tunnel is driven northwest across the strike of the coal measures, cutting the Dunmore No. 2, Dunmore No. 1, Clarke, New County and Pittston beds. This tunnel is 2,100 ft. long and 7x16 ft. in section. It has only sufficient grade for drainage until the Pittston bed is reached, where this bed is followed to the dip and whence the rock bed, which outcrops below the level of the tunnel, will be opened by a tunnel at a lower level.

The Dunmore No. 1 bed is not workable. The Clarke bed is treated in the same way as the workable Dunmore beds. The bottom split of the Pittston bed is not worked at present, but the top split is treated like the other beds. Above the Pittston is the Rock or Checker bed. This is not now being worked, but a tunnel is being driven to it from the Pittston. It is somewhat contaminated with rock, and not all of it can be used.

Ventilation at present is by two fans, both Jeffreys. One is at No. 3 shaft, which is sunk to the level of the Clarke bed. The other is at No. 2, the man and supply shaft, near the main No. 1 shaft. The fanhouses at both shafts are built double, and it is planned that other fans shall be installed when needed. Judging from the amount of air now circulating, it will be a long time before the additional fans are required, yet this will be an extensive mine, as the coal property is large and it was advisable to plan for needs which will be certain in the future. Both fans are driven by Ridgway four-valve engines. Some gas is found, but not enough at present to make the use of safety lamps necessary.

All haulage is electric, and there is not a mule in the mine. Jeffrey 7-ton locomotives are used for most of the work, though there is one General Electric 13-ton machine. There are 12 of the 7-ton locomotives now on the property, and 8 more have been ordered. On the surface there is one General Electric 7-ton storage-battery locomotive with Iron-Clad Exide batteries. This was installed to avoid the use of trolley wires above ground. In the mine all haulage roads are driven with a uniform grade of 1 per cent. in favor of the loads. With this arrangement it is easy to get locomotives that can do the work required without overload and consequent possible injury to the motors.

In some parts of the mine the locomotives are used to push cars into the chambers, and some of the work is quite severe. All trolley wire is No. 0000 which is well

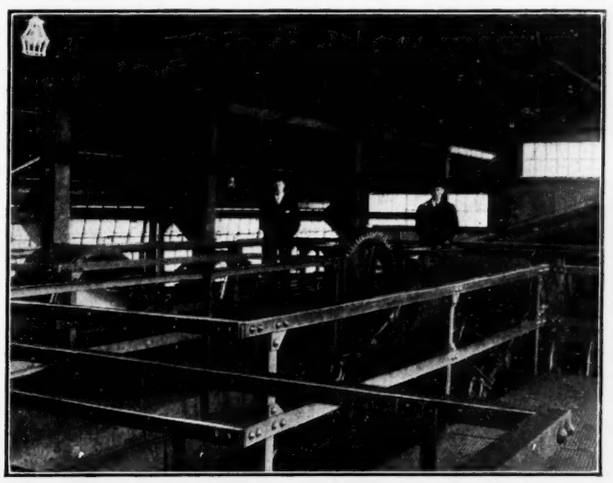

FIG. 2. HEAD OF MAIN CONVEYOR

supported. The voltage is 250. Track is laid with 45-lb. rails on 36 in. gage. All cars are of steel with plain bearings and are such as are familiar in the bituminous districts.

Drainage, while it does not present the serious aspects here that it does in some districts, is a necessary part of the mining. Water from the rock tunnel and from the beds above this level drains to a sump from which it is pumped to the surface. The main pumping equipment is two 3-stage centrifugal pumps made by the Scranton Pump Co. As the water is quite acid, these have bronze impellers and bronze linings. They are driven at 870 r.p.m. by Westinghouse induction motors of 100 hp., operating on a 440-volt, 3-phase, 60-cycle circuit. These pumps have 8-in. cast-iron suction and discharge lines.

One pump handles all the water, which amounts to about 700 gal. per minute. At present all mine water is delivered to a wooden tank in the washery, from which the washery is supplied. As this tank has an overflow, the head on the pipes in the washery is constant. The head on the mine pumps is about 260 ft. At various points 6 other pumps are used, all being portable. They are all 7x9 in. and are driven by electricity with one reduction in speed.

A water-level gangway is to be driven to connect with No. 1 colliery about 6,500 ft. away. The sump has been

so located that the water can overflow from it into this gangway and flow without pumping to No. 1 colliery and thence, through a water tunnel already in use, to the Lackawanna River. As much water as is needed will be pumped to the washery, and the remainder will thus drain without trouble to the river. When this arrangement is completed, it will be impossible for the pump room to be drowned. Also the whole colliery, including the power house, could be shut down without any serious damage other than the drowning out of the workings to the dip of the water level gangway.

All chamber coal is undercut by electric mining machines of the short-wall type. Machines of four manufacturers are being thoroughly tested—Goodman, Jeffrey, Morgan-Gardner and Sullivan. This is not to be considered a test of machine mining, for that is already established so far as this colliery is concerned, but of the style and make of machine best suited to the work. All of these are cutting 5½-in. kerfs. It has been found that when a lower cut is made the coal is likely to spring down when shot, without breaking, but that with the higher cut the coal is broken because its elasticity is not sufficient to allow it to move through this distance without fracture. Cuts are 6 ft. deep.

The company has made dies for sharpening the bits on the compressed air sharpening machine used for drill bits. There are 17 machines at the mine and 13 now operating. The machine runners are paid at a certain rate per car of coal under cut. Out of this amount they pay their helpers.

No difficulty is encountered in keeping the machines up to the face. It is not found profitable to use the machines in entry work, as the entries are only 12 to 14 ft. wide. Jacks cannot be used in thick coal because they are not stiff enough, and it is necessary to drill anchor holes in the rib close to the face.

The use of mining machines is comparatively new in the anthracite fields. They are well established in the bituminous regions, but it has been feared that the severer duty of the anthracite fields would make their use unprofitable. It looks, however, as if this fear had no good foundation, and apparently the machine has come to stay. It will undoubtedly accomplish economies if it will stand up to the work, for it will decrease the amount of powder used, with the accompanying weakening of the roof, and it will decrease the amount of fine sizes due to the pulverizing and shattering of the coal as in the old method, and there will be no coal blown into the gob.

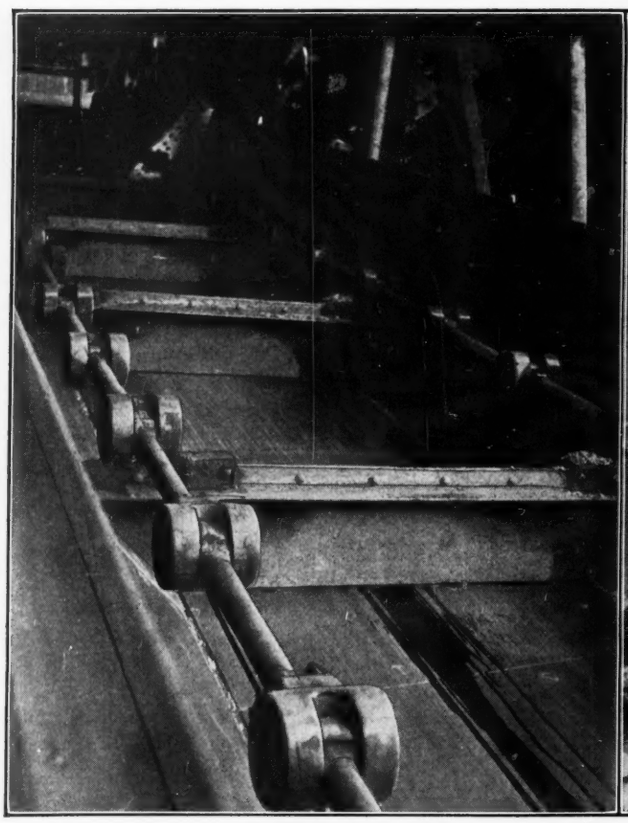

FIG. 3. ASCENDING SIDE OF MAIN CONVEYOR

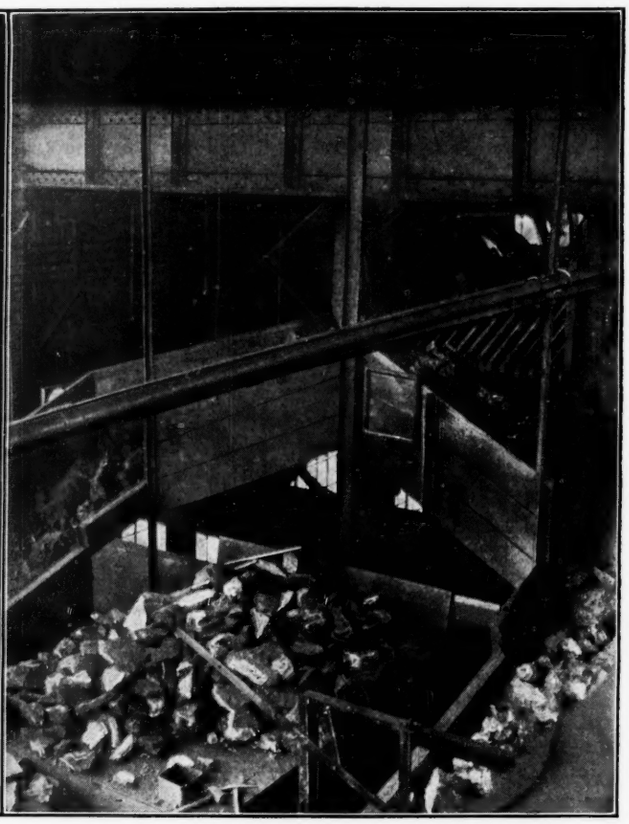

FIG. 4. GRIZZLY AND MAIN CHUTES

One detail of the layout should be noticed particularly; every tenth chamber is left solid or unopened, so that in case of a squeeze this will arrest it and the damage will be confined to a small area. Chambers are 25 ft. wide and are turned on 45 ft. centers. Breakthroughs are driven every 50 ft., so all pillars are uniform bodies of unbroken coal 20x50 ft. in size.

Caging is partly automatic. The cars approach the shaft on a 2 per cent. grade, and the two cars next to the shaft are controlled by dogs operated by the cages, so that when a cage is ready, the car next to it is released. Rapid caging requires the assistance of men to give the cars a quick start. The main shaft has four compartments, and each side can handle three cars per minute. The surface equipment will handle about as much coal as can be hoisted from the shaft. The mine will be

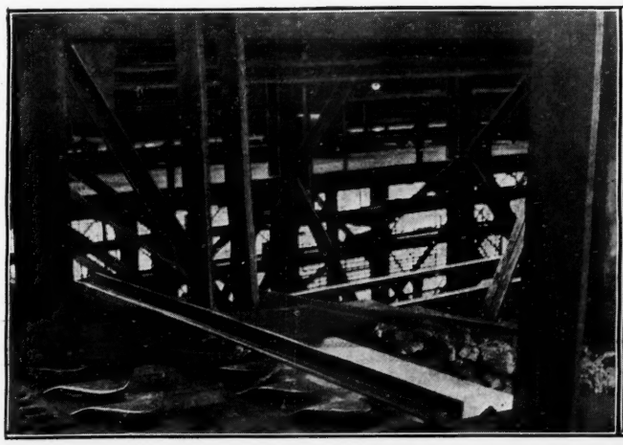

FIG. 5. KERRIGAN SLATE PICKER

FIG. 6. EMERY SLATE PICKERS

easily able to supply all the coal the breaker can handle. The inside hospital is near the outer end of the rock tunnel. It is well supplied and seems to entirely meet the requirements. One plan that has been adopted to prevent inconvenience and possible accident is the building of a concrete walk with a substantial iron railing along the side of the foreman's inside office. This prevents crowding about the window and onto the track.

The first impression of the surface arrangements at Underwood is that they present an attractive appearance. This may not amount to much in the way of efficient operation, but it shows that care and attention have been given them and the owners have pride in them. Generally such thought for appearances has to follow after provision for economical and efficient performance, so it is only fair to assume that the Pennsylvania Coal Co., in planning the latest of its collieries, should look first to the accomplishment of good work and then to external embellishment. And the fact that the officials are giving attention to appearances shows that the plant is good enough in their view to warrant contentment with its performance and care for the less essential point of external appearance. The breaker, main shaft house and shop are covered with corrugated iron; the other main buildings are of brick.

The main, or No. 1 shaft is situated about 275 ft. from the breaker. The hoisting equipment for its four compartments is two Vulcan first-motion steam hoists, one for each pair of compartments of the shaft. The engines do not get up to full speed in making a hoist, but their excess of power enables them to pick up quickly and avoids loss of time in acceleration. These engines are 24x42 in. They have steam reverse, combination hand- and steam-operated brakes and Welch overwinding devices. Self-dumping cages are used, and the coal goes directly into the main conveyor.

The man and supply, or No. 2 shaft is situated near the power house. This has two hoisting compartments and one for air. It is 230 ft. deep. It has a Vulcan hoist with a Nicholson overwinding device. No. 3 shaft has the same hoisting equipment, but is provided with the air compartment. At the same place there is provided an electric hoist for operating the slope in the Pittston or Big bed, which will be 2,100 ft. long. Here also there is being installed a 500-kw. motor-generator set for furnishing current to a portion of the mine. It is driven by a 700 kv.-a. synchronous motor.

All three slopes, except the rock slope, are operated by 300 hp. induction motors with contactor control. The gears are of the staggered herring-bone type, and the hoists work with little noise. Each hoist is designed to handle 400 cars per day in 10-car trips at a rope speed of 500 ft. per min. The rock slope is operated by a 150-hp. motor. It is 600 ft. long, has a 25 per cent.

FIG. 7. SPIRAL CHUTES, SPIRAL PICKERS AND EMERY SLATE PICKERS

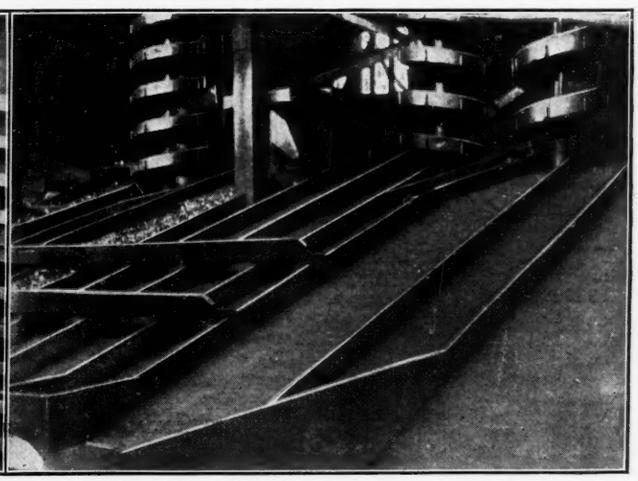

FIG. 8. BOTTOMS OF SPIRAL CHUTES AND PART OF MAIN PICKING FLOOR

grade and is intended to handle 30 4-car trips in 9 hr. at a rope speed of 400 ft. per min. The hoists for the rock slope and the Dunmore No. 3 slope are in the same building. The Dunmore slope will be be about 4,200 ft. long. The hoist for the Clarke slope, which will be 3,000 ft. long, is situated in the village.

The shop is a steel building almost entirely inclosed in glass. The roof is corrugated iron, and the sashes are steel. The equipment is somewhat more complete than usual; in all there are about 15 machine tools. Each tool is driven by an individual motor. There is a Leyner compressed-air drill sharpener, used to sharpen the bits for the hand drills and the machine bits. All rock work in the mine is done with Jackhamers. Air for shop use

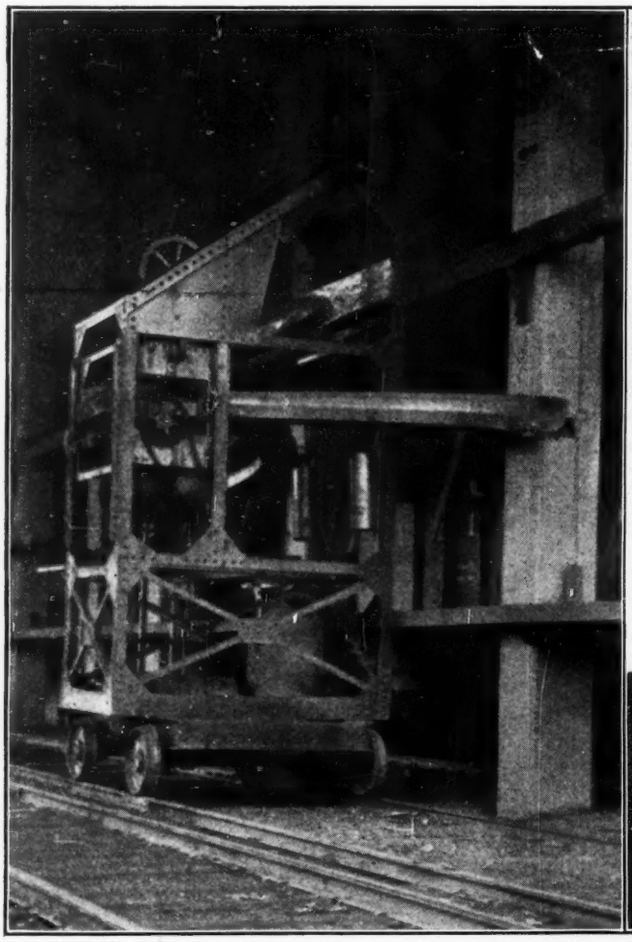

FIG. 9. FAIRBANKS-MORSE BOX-CAR LOADER

FIG. 10. VIEW OF REFUSE DUMP

is supplied by a 10x10-in. Sullivan compressor driven by a 30-hp. induction motor. The shop is served by a 10-ton electric crane. One end, separated by a wire partition, is used as an armature room.

The storage shed for large and heavy supplies is between the shop and the breaker. This has a concrete platform, iron frame and corrugated-iron roof. Adjoining this is the supply house, a steel-frame building, the sides and roof of which are covered with corrugated iron. One corner is occupied by the office and another by the distributing room for oil and mine supplies. This room has seven Bowser oil pumps.

Next to the storeroom is the combination hospital and wash house, a two-story brick building. The hospital occupies the end next to the storeroom. It is a room about 12x20 ft., well lighted and well equipped. The dressing room is about 20x75 ft. It has a cement floor and well-designed cement benches. Along the walls are ventilated steel lockers. The other end of the building is the wash room. This is 18x20 ft. and is divided through the middle by a partition. Each side has five showers. The roof is ceiled with wood and covered with corrugated iron.

The boiler house contains five 400-hp. Stirling boilers. These are hand fired with barley coal, which is delivered from the breaker by a drag conveyor to the bins opposite the boilers. These have openings at convenient points at the bottom. The shoveling platform is raised about 8 in. above the floor of the boiler room to decrease the labor of firing. The fuel bin was made by putting in a partition parallel with the outside wall. Ashes are dropped to cars in a tunnel which extends under the entire length of the boiler room.

The fires are run on balanced draft, pressure being furnished by fan and suction by the stack, which is 200 ft. tall and about 10 ft. in internal diameter. Beside the ordinary ladder, a safety ladder is provided, through which one has to pass in climbing the stack. This renders it almost impossible for a man to fall unless he should lose consciousness, and it is improbable that he would fall even then. Feed water is heated in a Cochrane heater by exhaust from the compressor, the feed

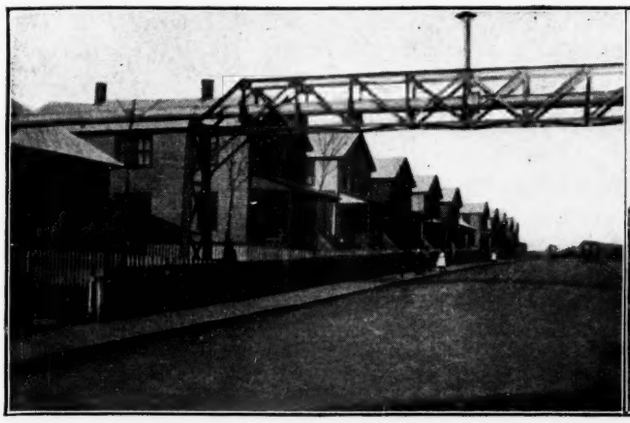

FIG. 11. MINERS' HOUSES, UNDERWOOD VILLAGE

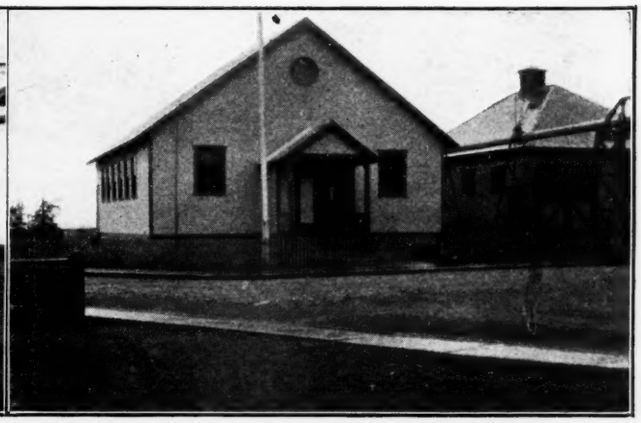

FIG. 12. SCHOOL, FIRE AND AMBULANCE HOUSES

pump and the auxiliaries in the power plant. The boiler plant was designed for a pressure of 200 lb., and nearly that pressure is maintained.

The principal electrical equipment of the power house is three Allis-Chalmers Parsons turbo-generators, each producing 3-phase, 60-cycle current of 235 amperes at 2,300 volts. These machines are normally rated at 750 kw. with 80 per cent. power factor. To convert this current for mine use there is a motor-generator set having a 700-kv.-a. synchronous motor and supplying direct current at 250 to 275 volts. This set runs at 720 r.p.m. The turbines are run condensing, and a vacuum of 27 to 28 in. is maintained. Condensation takes place in Alberger Spiroflo surface condensers. The circulating water is cooled in Alberger cooling towers. There is one compressor, an Ingersoll-Rand Imperial Type 10, for supplying the mine drills.

The power plant is being carefully investigated for fuel economy. Steam and water as well as fuel meters are used, and a daily log is kept of fuel input and steam output in the fire room and steam input and electrical output in the power house. This is an entirely modern power plant designed for the maximum economy in power production.

Outside there are the old familiar steam lines, which are used for heat as well as power. The main hoists, the man hoists and the fans are steam driven and heat as steam is carried to the buildings and the village.

While one does not like to see long steam lines, it must be realized that they were put in because of the known reliability of steam machinery and the reluctance to subject men in the mines to any hazard, even an almost insignificant one. These steam lines have been given unusual attention. The supports are of angle irons set in concrete piers. The pipe is insulated with 2 in. of felt and 2 in. of asbestos pipe covering. The whole is protected by a wrapping of galvanized iron held by a spiral binding of wire. Because of the high pressure carried careful attention was given to the pipe fittings. There are no screwed joints, and forged flanges only are employed.

The real center of interest on the surface is of course the breaker. This one is new and as efficient as the engineers could make it with the most modern machinery. It is built of concrete up to the top of the pockets, then of steel covered with corrugated iron. The accompanying illustrations show that it is well lighted. It is 146 ft. 8 in. high, 212 ft. wide and 234 ft. long. The machines are driven by motors, 31 being used for breaker service. In some cases several machines of the same kind, such as jigs, are driven by the same motor, but the scheme approaches individual drive.

The aggregate horsepower represented by these 31 motors, among which the 200-hp. conveyor motor is not included, is 840. Eleven motors driving shakers have an aggregate power of 270 hp. Conveyors use 8 motors with a total of 205 hp. The rolls are driven by 5 motors with a total of 165 hp. In each case the rolls are driven through a silent chain drive, thus having two reductions in speed in the gears and one in the belt. The jigs are

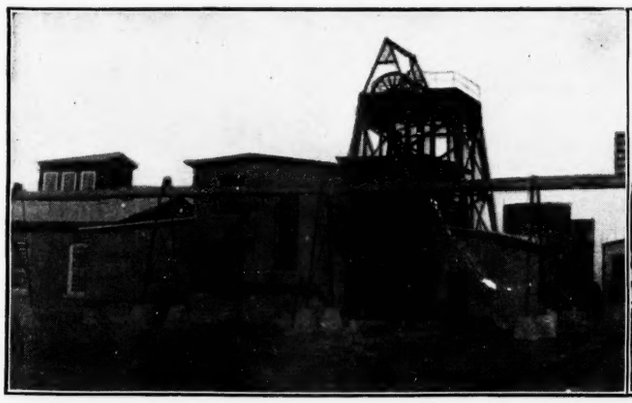

FIG. 13. SHAFT NO. 2

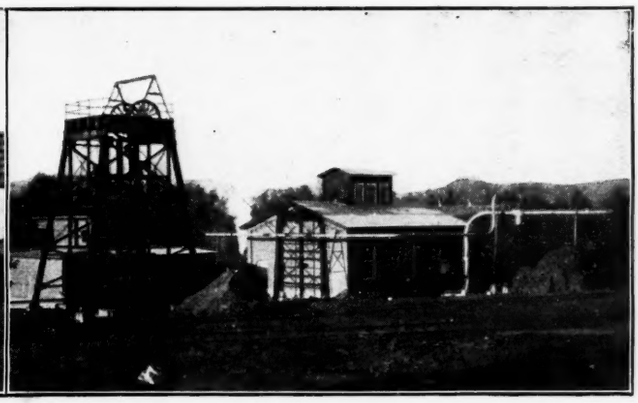

FIG. 14. SHAFT NO. 3

driven by three motors with a total horsepower of 120. There are three elevators, each driven by its own motor, the whole amounting to 70 hp. The pickers have one motor of 10 hp.

A good plan adopted by the engineer is the preparation of a chart showing the details of all gears and pulleys. This will be useful in replacing parts and in changing speeds if that should be desirable. It shows the letter designating each motor; the teeth, face, bore, keyway and pitch of primary gears; the same for secondary gears; the diameter, face, bore and length of hub of pulleys, and the width of chain, pitch of chain, number of teeth, bore and keyway of primary and secondary chain-belt gears.

Chain belts are used on the rolls, primary and secondary reduction gears on one elevator and belts and pulleys on the shakers and pickers.

The breaker is almost free from noticeable vibration. This is because of its heavy construction, the lack of synchronism in its various machines and the fact that the

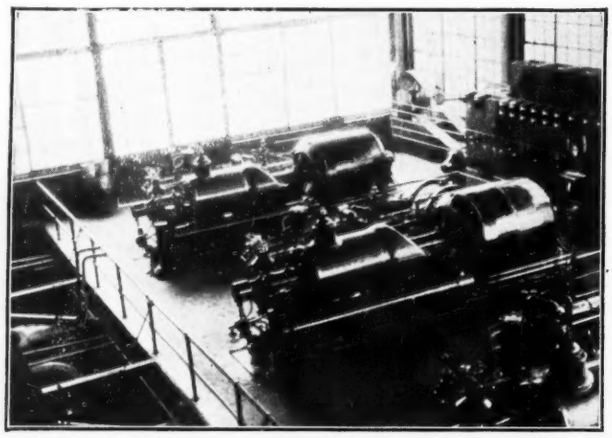

FIG. 15. INTERIOR OF POWER HOUSE

shakers are not all in line, but part are at right angles to the others. Bearings are equipped with Yeager boxes, and one pint of oil is sufficient for a week on ordinary slow-speed bearings.

The storage pockets and the concrete hoppers taking the jig feed from the screens are coated with Viranium. This has been found to resist the wear of dropping coal and acid water very well. The same material was used as a top dressing on the roofs of the track scale houses.

Coal is brought from the hoisting shaft by an inclined Monobar conveyor with 2-in. bars. This is 300 ft. long. The driving power is a 200-hp. motor. The head of the conveyor line and the driving machinery are shown in Fig. 2. Figure 3 shows a portion of the ascending side of the conveyor, which runs very smoothly. This conveyor has a capacity of 500 tons per hour, so it is possible to get into the breaker 4,500 tons or possibly 5,000 tons, in 9 hr., though it is intended that the ordinary output shall be about 3,500 tons.

Coal from the conveyor goes over a 3-in. grizzly; oversize goes through the chutes shown in Fig. 4, where it is picked, and to the coarse rolls. After breaking, it has the same treatment as the undersize of the grizzly. The undersize from the bar screen goes to the mud coal shaker which makes grate, egg, stove, chestnut and undersize. The undersize goes to the washery. Nothing below chest nut in size is prepared in the breaker.

The end of the grate screen has a Kerrigan slate picker, made by the Cross Engineering Co. This is a steel sheet, staggered openings in which are covered with raised lips. Flat pieces slide under and through the holes, while thick pieces go over. This is shown in Fig. 5. None of these machines is used on the broken-coal side. Grate coal goes to rolls and then to a shaker making egg, stove, nut and undersize. Undersize goes to the washery, chestnut goes to the pocket, egg and stove to the picking floor, or egg can be crushed and sent to a shaker making stove and chestnut, from which the stove would be sent to the picking floor and the chestnut to the pocket.

From the mud-coal shaker egg, stove and chestnut go to Emery slate pickers. These are shown in Fig. 6 The coal slides down a chute and across an opening having an adjustable lip. Coal acquires a high velocity and jumps the opening, while slate, moving slower, falls through. There are 16 of these pickers in the breaker. Egg and stove go by spiral chutes to the main picking floor; chestnut goes by spiral chutes direct to the pocket. The spiral chutes are shown in Fig 7, which also shows the Emery pickers and the spiral pickers. Fig. 8 shows the bottoms of the spiral chutes and a portion of the main picking floor. Egg and chestnut tailings go to spiral pickers, from which bone goes to the washery and refuse to the dump.

Preparing the Undersize

The feed to the washery is undersize from the chestnut screens and tailings from the breaker. This is sized into stove, nut, pea, buckwheat, rice and barley. Stove goes over an Emery flat slate picker. Flat pieces go through the openings between the hinged bars, while thick pieces go over. Heads go to the jigs and tailings to refuse. Stove bone is crushed to chestnut or smaller and sent back to the jigs.

Chestnut goes over a Mowery picker. This is somewhat similar to the Emery flat slate picker, but has longitudinal bars which are not hinged. Heads go to the jigs and tailings to a spiral picker. Pea goes direct to the jigs. Considering the whole treatment: Egg and stove are hand picked; chestnut is not hand picked; jig products are stove, nut and pea; buckwheat, rice and barley receive no treatment except screening.

There are 5 rolls, 16 Emery pickers, 6 spiral pickers and 8 double Lehigh Valley jigs. Coal is loaded into box cars by Fairbanks-Morse loaders, one of which is shown in Fig. 9.

As this colliery is rather remote from a town, it was necessary to build houses. The village of Underwood has two streets. On one side of one is a row of 6 single dwellings for the officials. These are heated by live steam. Both sides of the other street are occupied by miners' houses. There are 20 of these, all double. It is quite noteworthy and commendable that there is not a red house in the village. Different colors are used, no adjacent houses being of the same color, and the effect is quite pleasing. The school house is used for church and Sunday school and for other meetings.

The miners' houses do not have bath rooms, but two bath houses have been built, one for English and the other for foreign families. Each of these has 6 tubs, each placed in a separate room with a dressing room at one side. Three families have the use of each room, and the

time is divided so that there are no conflicts. A janitor sees that everything is kept clean.

While Underwood has been operating for some time, it is not considered entirely finished. The engineers are still improving the power production, the mine is not wholly developed and the surface has not been given its final appearance. Grading is nearing completion. After this is finished, the surface will be sodded, cement walks laid and hedges planted. It will be not only a large producer and an efficient colliery, but an unusually beautiful one.

The Pennsylvania Coal Co. has extended every courtesy that could aid in the preparation of this article, and the writer wishes to express his appreciation of the kindness of the officers who have helped him.

Heavy Stocking Operations in the Middle West

A canvass of the principal railroads and large coal-consuming industries shows that the majority are stocking a considerable tonnage of coal in anticipation of a cessation of milling operations on Apr. 1. The following information, obtained from sources considered reliable, shows approximately what is being done in this respect:

New York Central lines; Chicago, Indiana & Southern; Indiana Harbor Belt—75,000 tons at Gibson, Ind., 60,000 tons at Elkhart, Ind., and still storing; sufficient tonnage to last 60 days.

Pennsylvania; Grand Rapids & Indiana; Vandalia—Have placed open orders with all operators on their lines for all surplus coal; large tonnage now on ground and figure on 60 days' supply.

Michigan Central—75,000 tons at East Gary, Ind., 60,000 tons at Michigan City, Ind., 50,000 tons at Kalamazoo, Mich., 50,000 tons at Wasepi, Mich.; sufficient tonnage to last 60 days.

Big Four—50,000 tons at Harrisburg, Ill., storing at Lyons, Ill.; sufficient tonnage to last 60 days.

Grand Trunk—80,000 tons at Battle Creek, Mich.; sufficient tonnage to last 70 days.

Illinois Central—Now storing 300,000 tons on northern lines and 60,000 tons on southern lines; equal to 45 days' supply.

Chicago & Northwestern—Now storing coal for about 60 days' supply.

Chicago, Milwaukee & St. Paul—Has 400,000 tons coal on docks; about 35 days' supply.

Chicago, Burlington & Quincy—Has 200,000 tons on ground for eastern lines; about 30 days' supply.

Soo Line—25,000 tons at Kolze, Ill.; sufficient to last 60 days.

Chicago Great Western—25,000 tons being stored on ground.

Chicago & Alton—Now storing about 70,000 tons; 60 days' supply.

Cotton Belt—Just started storing at various points.

Nickel Plate—Just started storing at Stoney Island.

Standard Oil Co., Whiting, Ind.—Already stored 50,000 tons and still storing for 60 days' supply.

United States Steel Corporation; Illinois Steel Co.; American Steel and Wire Co.; American Tin Plate Co.; American Bridge Co.; Universal Portland Cement Co.; Inland Steel Co.—Have upward of 300,000 tons on ground now and plan by Apr. 1 to carry on ground and in cars 60 days' supply.

Commonwealth Edison Co. and subsidiaries—Storing for 80 days' supply; 300,000 tons now on ground.

Armour & Co.—Arranging for 50,000 tons.

Swift & Co.—Is now storing coal.

Cudahy Packing Co.—Is now storing coal.

American Brass Co., Kenosha—Has stored 25,000 tons; 90 days' supply.

Sulzberger & Sons Co.—20,600 tons on ground and still storing.

International Harvester Co.—Is now storing coal.

Western Electric Co.—Is now storing coal.

Great Britain Has Coal for 500 Years is the calculation of one of our English exchanges. It was reported by the Royal Commission on Coal Supplies in 1905 that there was 100,000 million tons of coal in the proved coal fields and 40,000 million tons in the unproved fields. But the calculation rests entirely on the assumption that the present rate of consumption will not be increased. Forty years ago Great Britain's coal production was 132 million tons, of which 14½ million tons was exported. In 1903 it was 230 million tons, and in 1911 it was 272 million tons, or more than twice what it was in 1875. If this rate of increase is maintained, the estimate of 500 years will dwindle to two figures before the present century has expired.

A New Labor-Saving Device is now being tried out at the Taylor colliery of the Delaware, Lackawanna & Western Railroad Co. The men have christened it the "Iron Laborer." The machine is designed to replace the men with the scoop shovels, who have loaded the mine cars in the mine. It is operated by hydraulic pressure, and its working arrangement slightly resembles the big scoop shovels used on construction work. The scoop digs into the coal as it is blown down and hoists it into the car.

Written expressly for Coal Age

The Message

BY RUFUS T. STROHM

They found him there in the velvet dark,
His pulses stilled and his figure stark;
For though with heroic hearts they faced
The rescue work, and they toiled with haste,
They came too late and they found him dead,
His breathing hushed and his spirit fled,
His life snuffed out by the afterdamp
As a blast of air snuffs a miner's lamp.

But close at hand, on the rugged face
Of a piece of rock, he had knelt to trace
A parting word and a note of cheer
To those above, whom he held most dear,
Before the foe in its stealth should creep
And close his eyes in a dreamless sleep;
"No hope is left, and I've got to die,
But I'm not afraid of the end. Goodby."

A hundred times, in his daily work,
He'd seen grim death like a specter lurk
In a dust explosion, fall of rock,
A rush of gas, an electric shock;
And he had laughed in his inmost soul
To see death robbed of its human toll,
Dismissing fear with a careless shrug
Of his splendid frame, as he drilled and dug.

And so, on the face of the rock he wrote
With a steady hand his farewell note,
Denying aught of a craven's fear
Although the end of his shift was near;
A message plain that the searchers found
And carried back to the upper ground,
To show the world he was not dismayed,
But died like a Spartan, unafraid.

Workmen's Compensation Law and Mine Safety*

By H. M. Wilson†

SYNOPSIS—Methods by which the basing rate of the coal industry in a state and the mine rate of any individual mining corporation are determined by stock corporations writing insurance.

The methods of the ten underwriting concerns forming the Associated Companies for inspecting and rating the hazards in coal mines and rating the reduction or increase to such base rates as may be approved by the state insurance department form the subject of this paper.

The Associated Companies consists of a group of ten of the best-known stock casualty-insurance companies, organized for the purpose of jointly insuring the mine owner against his risks under workmen's compensation acts. The Department of Inspection and Safety of this body will act somewhat as does the National Board of Fire Underwriters in respect to fire insurance to the extent that all applications for coal-mine insurance reaching any member of the association are referred to this department. Upon receipt of an application it is given a record number and must await its turn regardless of the source from which it may have come. Thus, there will be no preferential or special treatment in inspection and rating no matter which company or agency the operator may have requested to accept his business.

Elements Considered in Deciding a Rate

Base rates that correspond to the risk of insuring the average mine in the state have been computed by the actuaries of the association. There is one such rate for the bituminous region and another for the anthracite. These depend upon the statistics relative to accident frequency published by the State Mining Department and the Bureau of Mines. Other considerations in the computation of the base rate are the application of the compensation law to different kinds of accidents and the degree of compensation made necessary by the size of the family possessed by the injured. Finally there had to be added what is known as the expense loading, an item which represents the estimated cost of doing the business.

Each mine is then inspected to determine the relative importance of the hazards contained therein, and these are reduced to a basis comparable with that of the average mine of the state. As a result each mine is credited or debited according as it may merit a rate better or worse than the average mine, and a so-called schedule rate is applied to the base rate. The policy will be written at the rate thus finally adjusted. In due course either the adjusted rate for each mine or the methods of inspection and computing the adjusted rate must be approved by the State Insurance Department. As yet the exact procedure in this regard has not been determined.

The report of inspection shows in detail the elements in the mine which failed to conform to the standards of safety adopted by the association. It is accompanied by recommendations for changes such as would bring the mine up to the standards established. The adjusted schedule rate is referred from the Department of Inspection and Safety through the member company and its agent to the mine operator, so that he may accept or reject the adjusted rate. Should he insure, he may then proceed at once to make his mine more safe in accordance with the recommendations or in so far as he may think profitable, having in mind the relative cost of such improvements and the reduction in premium that will result from making them.

Having made the improvements, he will then write to inform the insurance company that he has done so and ask for a reinspection and rerating. Such inspections will be made at the earliest date convenient to the association, but any improvement in premium rate will apply on the date on which the application for reinspection was made, providing the reinspection reveals that the improvements were made as reported.

It has been the good fortune of the mining industry that it has been the first industry to receive state, governmental and private consideration as to safety of its employees. This was owing in a large measure to the imminence of the hazards. It has resulted in the creation, in this state at least, of a splendid inspection force, guided by admirable safety laws and regulations.

In spite of these conditions, however, mining has been the last of the industries to benefit by that added impetus given by sympathetic protection. This has been due to the belief of insurance companies that the risks in mining are so great that they could not safely underwrite them unless they fixed rates so high as to discourage their acceptance.

Self, State, Mutual or Stock Insurance

Workingmen's compensation legislation now places upon the mine operator obligations which are so great and as yet so incomputable compared with those incurred under liability legislation that he can no longer risk the possible insolvency that may result from self-insurance or dependence on some form of insurance which does not insure. He may be compelled to pay heavy indemnities to a large number of men, should a severe mining catastrophe occur in which they are injured. And he cannot overlook the certainty that he will have to pay a sum which in aggregate is far larger because of the more numerous minor or so-called normal accidents, because the settlements to be made to a man who is permanently injured or to the heirs of one killed may extend for periods of 10 or even 16 years, thus constituting a lien against the property of the employer for that period of time.

The law properly provides that mine operators shall be insured in institutions and under conditions to be approved by the commissioner of insurance. It also creates a state fund for the purpose of providing insurance in case the same cannot be procured from private sources or at satisfactory rates. The law permits an employer

*Address prepared for the session of Dec. 23, 1915, of the Coal Mining Institute of America, held at Pittsburgh, Penn.

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to carry his own insurance only in case he can furnish to the state adequate proof of his ability to meet his obligations during the maximum period of liability.

In addition to insurance in the state fund and to self-insurance, insurance may be obtained in one of the old-line stock casualty-insurance companies or in an employers' mutual. In considering the relative merits of these various forms of protection I think we may safely dismiss consideration of the mutual company, for the present at least, in so far as such form of insurance may be applicable to coal-mining hazards. No mutual insurance association in any state has, so far as I know, dared to underwrite the unlimited liability required under workingmen's compensation laws. A few have been organized to write limited liability, thereby failing to furnish protection against those great disasters which may carry off a dozen or a hundred men at a stroke.

Moreover, under mutual insurance the mine operator would be burdened with an unknown liability, due to the fact that the assessments made for its support would depend in amount and frequency upon the number of persons injured, because mutual companies have no capital, reserves nor surplus and may make any number of assessments according to their requirements. And finally the mine operator who is giving every consideration to the safe operation of his own property will not only have to bear the burden of his own assessments, but will in addition have to bear those of such of his member associates as may be operating their mines unsafely.

In considering mutual insurance, there is the further objection that workmen's compensation is as highly specialized an activity as is banking, coal mining, transportation or any other business. The mine owners who would compose the mutuals are necessarily unfamiliar with the science of insurance and cannot hope to manage such an undertaking successfully, as is evidenced by the fact that over three-quarters of those mutuals which have entered the casualty field have gone out of business.

Self-Insurance Involves Undertaking the Conduct of an Unknown Business

The last objection—lack of experience in insurance management—applies as well to self-insurance as to insurance in a mutual. Even though the company's financial condition may warrant its carrying its own insurance burden, it cannot safely do so unless a high-salaried insurance expert is engaged to manage the business, just as if the company were preparing to do its own banking or trust business. In all cases it would be necessary for the company to organize a department to conduct the business on modern lines. Rather than undertake this duty companies prefer to pay the necessary commission to a bank or a trust company because they are better qualified to handle loans and investments.

Furthermore, in self-insuring, the insurer will be embarrassed in the management of his mining business by the liability which he may have to meet should he have a large number of accidents or a catastrophe. This uncertainty makes it impossible for the employer to anticipate his liabilities, and in these days when contracts are made a year or more in advance, it is essential that the mine operator be able to estimate all the bills he will have to pay, whether those imposed by workmen's compensation legislation or any others if he is to estimate accurately the price per ton at which he can produce coal.

Finally, self-insurance, in addition to burdening the management with a new and unknown administrative obligation, thereby diverting it from its more important duty of operating the mines and selling the product, introduces the further complication and expense of attempting to follow up the seriously injured in their wanderings. An injured employee may be so far recovered that he can move about, and yet nevertheless under the law be entitled to indemnity for a number of years. Thus the mine operator in Pennsylvania may soon find that he has a dozen or more such dependents in Illinois, Colorado or Washington who are claiming their indemnity and yet may have so far recovered that they have been able to return to work.

Insurance Furnished by the State Board

This latter condition is one that cannot be adequately met even by the state fund, and against the latter there lies, furthermore, the serious objection that it is under political and not business management, that its personnel and methods of doing business may be changed at any moment as a result of a change in political control and that new and unexpected burdens may be suddenly placed upon the insured as a result of over-zeal on the part of a new administration or a political upheaval.

There is no justification for the claims that insurance in the state fund will alone relieve the insurer from liens that may run for a period of years. It is doubtful if such liens will be established, since to do so would require a proceeding on the part of the claimant involving the payment of costs. However, the law provides that insurance companies may discharge a lien by depositing the prospective amount due or by furnishing a bond. The Associated Companies will take care of liens should occasion arise.

In placing life insurance, though one may take a flier in some mutual concern, he will place his dependence in one of the well-known and substantial stock insurance companies, such as the Equitable, New York Life, the Metropolitan and their kind. Likewise, when insuring one's property against fire, one would hesitate to risk his solvency in some mutual or in a local insurance company. Where would the people of San Francisco, Baltimore, Chelsea, Houston and many other cities have been after their great conflagrations had they not in a large measure been protected by those great stock fire-insurance companies that do business throughout the whole world and have reserves and surpluses adequate to meet those demands which, though they may come but rarely, would mean absolute insolvency if not properly and adequately covered?

Realizing the situation that confronts the coal-mining industry, those great stock casualty-insurance companies which already do business in public liability, automobile, elevator and a dozen manufacturing and miscellaneous industrial employments hesitated long before assuming the unknown obligation involved in insuring coal mines. It was at once evident that there would be serious public reflection upon them were they to underwrite only the less hazardous industries, thus skimming as it were the cream off the milk, leaving the more hazardous business of coal mining without their protection. Since no one of the institutions felt that it could accept catastrophe hazards and offer reasonable premium rates with any assurance of paying expenses, ten of the strongest and best

known of such companies doing business in the United States associated themselves for the purpose of jointly underwriting coal-mining risks.

It has been found that even state insurance bureaus, such as those in West Virginia and Washington, are not strong enough to safely face the catastrophe hazard. This is due in large measure to the fact that with the state fund as with the mutual and with self-insurance in even greater degree, the distribution of the risk is limited to the confines of one state and to a comparatively few risks.

The widest possible distribution is essential to safe insurance management and solvency. The wider the distribution the larger the field for application of the law of averages and the smaller the ripple produced by a liability.

The claim has been made without any foundation whatever that the stock insurance companies must be charging high rates compared with the obligation, otherwise they could not stand the agency costs and earn necessary overhead expenses and profits. As compared with other forms of insurance, this great group of casualty-insurance companies has placed the agency and other expenses at the lowest figure ever fixed for such business. They did this because they were already transacting such business in other lines and could accept this new and heretofore-untried burden without seeking profit other than that which might come from their ability to invest premiums through the banking and trust facilities that all of them command.

It has been claimed that one or another agent of the individual companies composing the association is prepared to give preferential rates or better inspection service than others of the group. Such a statement is entirely without any foundation. The business of the Associated Companies is done jointly for all on an identical basis. It matters not which one of the companies is represented by the agent who desires to place the insurance. His application for inspection and merit rating of any mine goes through the same channel as do the others—to the Department of Inspection and Safety, where it is given priority only in the order of its filing. The inspection service and the merit rating are the same for all, and the latter must be approved by the State Central Rating Board and the Insurance Commissioner, thereby giving assurance that no one of these companies nor the state fund offers any advantage whatever over any other in this regard.

Will State Board Show Low Management Costs?

It is not conceivable that the state fund will be able to insure mines at a lower cost than can the Associated Companies. It is true the state fund will not earn profits, but as already stated, the profits which the Associated Companies plan to earn are so small that it is reasonable to assume that their greater experience, their immense surplus and reserve and the world-wide distribution of their risks will more than counterbalance this element.

The acquisition and service costs cannot be much less for the state than for the Associated Companies because the state insurance board must canvass for business and must furnish service if it expects to keep its funds intact so as to adequately protect its clients. The claim that the board may in time pay dividends does not appear to be borne out by the experience of other states. Furthermore, the state fund is authorized to change its rates at any time, whereas private companies may do so only with the consent of the state.

The activities of the Bureau of Mines in classifying and gathering statistics relative to the causes of accidents, in determining the nature of these causes and in devising means for their prevention have been a necessary preliminary to the step now taken for mine insurance; since without the statistical and technical data so gathered and the scientific principles thus evolved, it would be impracticable for insurers to offer premium rates graduated in accordance with the relative safety of the operation. As a preliminary an analysis of the various causes of accidents was made with a view to fixing a numerical value on each and applying to each safety measure a corresponding credit and to each hazard a debit value. In this work the association has been materially aided by the engineers of the Bureau of Mines as well as by several state mine inspectors, mine operators and higher officials of the mine workers' organization, with the result that it has developed a system of inspection and rating of mines as to safety, which is based on the percentage causes of accidents furnished by the statistics of each state and checked by the average for the whole United States.

Method of Arranging the Rating Schedules

Thus, for example, falls of roof and coal cause 43 per cent. of the injuries, haulage accidents account for 21 per cent. and so on. Each of these primary causes is made up of separate hazards, and to each of these latter is given a percentage value. Thus, the frequency of accidents from falls of roof and coal is dependent on the physical character of the roof and rib, the amount and kind of timbering, supply of timber furnished at the working places, inspection and testing of roof and a dozen other elements. The same method has been applied to haulage, shaft, electrical and other accidents.

The inspection of a mine by the engineer of an insurance company, with the fixing of numerical values for the relative safety of each of the elements which may produce accidents, has a marked influence in drawing the attention of mine officials to the hazards of their operations, the existence of which may not have hitherto occurred to them.

Even state inspection, with its police powers, is not so influential in pressing home the nature of the risk and the value of preventive measures as is an increased insurance rate or a reduction in insurance premium under workmen's compensation legislation.

The problem of safety in mining thus becomes at once a matter of earning power for the mine instead of being merely psychological propaganda. Instead of the mine operator spending large sums in the employment of lawyers for combating litigation, these sums may be devoted to improving the safety of his mine, thereby earning a reduction in the insurance premium, which under compensation legislation he feels compelled to pay.

The effect on efficient and economical operation is further felt in the improvement of appliances whereby the accident causes are reduced. Thus, haulage accidents are largely the result of bad roadbed, light rails, bad tracklaying and maintenance, faulty illumination in the haulageway, a bad haulage system, light and not tight cars and similar elements. Improvement in the character of the roadbed and track and of the cars and the haulage system will add greatly to the safety from haulage acci-

dents and will at the same time greatly increase the efficiency of operation by permitting the hauling of larger loads and at higher speeds for each trip.

Similarly the adoption of undercutting as a means of preventing blownout shots and the injuries resulting therefrom leads under many conditions to an improvement in the size of the coal and in the efficiency of production, as will many other safety measures. Finally, the unknown financial obligation that under uninsured liability legislation must be met by placing a higher price per ton on the coal is replaced by a known and fixed obligation definitely met by stock-company insurance, whereby the mine owner may figure to a nicety his liabilities on accident account.

Similarly in the matter of fire protection, improvement in insurance rates resulting from the introduction of fireproof materials about the headhouse or tipple, in the shaft and in the main entries, while it may have increased the safety from fires, has also reduced the charges against mine operation by increasing the permanency of the timbering and the efficiency of operation.

Considering now in detail the various causes of accidents to miners and the means which may be adopted for their prevention or amelioration, an inspection of the statistics of coal-mine accidents as compiled by the Bureau of Mines from state inspectors' reports, reduced to a comparable basis as to causes, shows that these may be divided into three main groups—underground, shaft and surface accidents. These three groups may be each again divided into ten or more separate causes, the methods for prevention of which are beginning to be fairly well known.

Psychologic Helps as Needful as Physical

Looking now upon these causes from the viewpoint of the safety measures for their prevention and adding to these physical safeguards those psychological ones which are comprehended in the safety-first propaganda, we find in substance as follows:

That where the attitude of the mine management and officials is favorable to safety and welfare work and where the number and character of underground bosses and inspectors are adequate to the work demanded of them their work will produce a sentiment favoring safety and make sure that discipline will enforce what correct safety engineering prescribes. Such safeguards as the company surgeon and hospital, first-aid and mine-rescue supplies, crews and training, illumination, telephones, signals and bulletins, all perform an important part in preventing accidents, or in more rapidly restoring the injured miner to normal condition.

We find that the means of preventing injuries from falls of coal or roof, from haulage, electricity, shaft, or slope or surface hazards can be similiarly stated and evaluated. So also can be sized up the dangers arising from the use of explosives, mine gas, coal dust or mine fires. The inspector is furnished with an itemized list of the mine hazards which may be removed by known methods, and he has standards of safety for each hazard to guide him. He makes a charge against the mine for each item that fails to come up to the standard. The sum of these charges is then compared with the aggregate charges found against the average mine of the state. As a result of this careful comparison an adjusted schedule or merit rate is computed for the particular mine under consideration. This process of schedule rating purposes so far as is humanly possible to produce a separate rate for each individual mine dependent on its respective risks and the safety measures adopted. It is then purposed to put the mines under the observation of skilled inspectors with a view to improvement and rerating.

If in time it is found that the average of all rates in a given state is lower than the average fixed for that state, this will mean either that each individual mine is better than the average or has been made better by the inspection methods, and this should result in a reduction of the average insurance rates. When this can be accomplished, the association will feel that its efforts have been successful.

It is the experience of the association that for those mines adopting the larger number of approved safe practices and measures, a very low premium rate can be offered and that the result will be to give financial encouragement to all mining companies to abandon unsafe and to introduce the most safe practices.

Fire and Coal-Mine Underwriting Similar

The Associated Companies corresponds to the Fire Underwriters Association, which for the member companies examines the buildings offered for fire insurance, fixes the rate and periodically inspects and re-examines the risks. As compared with this association, the United States Bureau of Mines will similarly correspond to the Underwriters Laboratories in Chicago, which latter makes tests of such fire-prevention devices as fire windows, doors, hose, automatic sprinklers, etc. The United States Bureau of Mines at its testing laboratories in Pittsburgh passes upon the relative merits of safety devices in mines, such as the various kinds of explosives and their permissibility, coal-cutting machines, safety lamps, electric lamps, etc.

The Associated Companies will correspond to the Fire Underwriters Association in the above example, examining in advance the mines offered for insurance, fixing the base rate and also schedule rates for the adoption and use of approved safeguards, devices and methods and periodically reinspecting such mines largely with a view to suggesting such improvements in safety measures as may earn a reduction in premium rate.

For the bituminous coal mines of Pennsylvania a manual rate of $3.57 per $100 of payroll has been offered for filing by the Associated Companies, the similar anthracite coal-mining rate being set at $4.33 per $100. The Associated Companies has announced that it will have the mines of its clients inspected by mining men skilled in the matter of safety in mining, and according as the results of the inspection may disclose any mine to be in a more or less safe condition than the average mine, the particular mine will be given a merit rating less or greater than the base rate. The method by which this inspection schedule rating should be done has been submitted to and has been approved by the state insurance department, though the base rate has not as yet received such approval. Of the first hundred mines already inspected more than half have been given premium rates less than the base rate, some very much less, while of the remainder few have computed rates much above the base.

With the report made to the mine owner stating the rate applicable to his plant is added recommendations for improvements in safety, which if made will materially re-

duce his rate. As a rule these changes are not expensive to make, many of them concerning only the moral hazard. Their purpose is by offering a lower premium to induce the mine officials to pay more attention to the education and supervision of employees as regards safety. Many of the mines which have been inspected by the association could earn a premium-rate reduction of 50 to 75c. by the expenditure of a few hundred dollars and some attention to safer mining methods and practices.

Insurance applied in this manner through expert outside inspection and safety engineering for the purpose of aiding the mine owner to cover his compensation obligations at the lowest possible cost is a tremendous force for improving the coal-mining hazard and reducing the large death toll due to this cause.

How an Inspector Gages the Moral Hazard

The last ten classes of items in the inspection report relating to physical hazards are familiar to all mining men, and all who know the mining law and have studied the causes of mine disasters know what constitute safe practices with respect to them.

The items in the first two classes covering the moral hazard appear to some, however, to include many so-called new-fangled forces, and some operators can see little relation between these items and greater safety. On the other hand modern safety engineering as practiced by the larger mining, metallurgical and manufacturing establishments and as interpreted by insurance underwriters places the psychological correctives of so-called moral hazards at nearly equal value with the material provisions called for in the ten classes relating to physical risks.

Accidents can never be prevented entirely, no matter how thoroughly the workmen may be safeguarded by physical means. The motors, cars, track and roadbed may be ever so perfect, and yet haulage accidents will occur. The roof may be well tested and timbered with a maximum of care, and still men will be hurt by falls. This is because of the human element sometimes called carelessness, forgetfulness, negligence or what you will, which is responsible for about 40 to 50 per cent. of all accidents. In other words though full compliance may be made with all known standards of safety as regards the physical hazards of a mine not over 50 to 60 per cent. of all will be prevented and the remaining 40 per cent. will still occur.

In the merit rating of casualties in other industries and as regards fire insurance it has been the practice to appraise this moral hazard by giving credits or making charges based on the opinion of the inspector regarding the attitude to his risks of the employer or owner. The association removes this discretion by basing the credits or charges for the moral hazard on the presence or absence of things indicating the normal attitude of the employer and in particular what he is doing to educate his men concerning the dangers of their occupation and how they may be combatted. Thus, the interest of the employer in the safety and welfare of his men is held to be best indicated by the presence of warning and danger signs, the appointment of safety committees, the erection of bulletin boards containing safety rules and slogans, the instruction in first aid, the erection of wash and change houses, the maintenance of escape ways in easily passable condition, the illumination of all mine entries and other passage ways, etc.

Extracts from a Superintendent's Diary

Every mining camp seems to possess its "bully" or "Bombastes Furioso," and our camp is no exception to the rule. His name happens to be rather unpretentious, however—it is just plain James Smith.

For several weeks past he has seemed to be on his good behavior, but this morning he dropped back into his favorite ways, probably just to let us know that he had not lost any of his cunning. A crowd of miners were lined up at the magazine waiting their turn to get a day's supply of ammunition and carbide when James arrived bent on the same purpose. Just as he came up he noticed a new man in the line, and after sizing him up from the rear, walked up close to him and followed him up to the counter. The stranger called for a day's supply of powder and carbide and began to count out the proper amount of commissary checks to pay for the same. The clerk laid the supplies on the counter before the customer finished counting out the correct change, and James, stepping up, picked up the stranger's purchases and started off with them in the most matter-of-fact way imaginable.

When the stranger turned about to see what had happened and observed Smith walking off with his supplies, he assumed that Smith was "kidding," and entering into the spirit of the game as he saw it, called after him to thank him for assisting him with his load. The spectators hastened to assure the stranger that he was dealing with a "dangerous man" and advised him to drop the matter without further comment. For a moment the victim seemed puzzled, but it was for a moment only. "So that is how the land lays here, is it?" he remarked, and turning about, ordered another supply of ammunition just as if nothing extraordinary had happened and started off for the mines.

Mr. Smith Disappears

At quitting time this afternoon the gatekeeper found that James Smith had not registered "out" and immediately called up the assistant foreman inside to sound the alarm. "Was his buddy at work today?" called back the foreman on the phone. "He was not," replied the gatekeeper.

When the foreman reached the neck to Smith's room he hallooed, but received no response. Then he hurriedly went up to the face of the room, but still found no trace of Smith, although he noticed that his tools were scattered about as if the owner had been called from his work unexpectedly. "Something mysterious about this," reasoned the foreman, and he was at a loss to know just what to do next. Then he thought he heard a faint groan. This set him to investigating, and finally over near the gob rib he discovered Smith.

He was stark naked and was shackled to a mine prop, Indian fashion. His mouth was gagged with his cap, which was held in place by one of his socks tied around his face. The balance of his clothes was nowhere to be found.

Mr. Tripp loaned him his coat, and after restoring circulation to his limbs, assisted him up the manway. The entire journey was made in silence, as Smith seemed to have lost the use of his tongue.

Later in the evening Mr. Tripp, the assistant foreman, came over to see me about the affair. When he had finished the mysterious narrative, as he called it, I asked him if John Sweeny, the miner who started work this morning, had been seen near Smith's room during the day. He considered for a moment, and then a light seemed to penetrate through the mystery.

"Well, I declare, Mr. Thompson," he said; "you should have seen the blank look on Smith's face as on the way home we passed a kid who asked him if he thought Sweeny would get along well in our camp, and you know I didn't even tumble."

The Labor Situation

SYNOPSIS—Scale to be provided for strip-pit mining in District 21. The Sunday Creek Coal Co. is alleged to be preparing for a reduction in the scale rate in Ohio. Frank Farrington is reëlected in Illinois.

The Southwestern Interstate Coal Operators' Association and a committee of the United Mine Workers of America recently prepared an agreement whereby the strip-pit scale now in force in the State of Kansas will go into effect for 30 days in the State of Oklahoma. A commission was appointed to adopt a new scale to go into force in Oklahoma at the expiration of the 30 days. It was provided that this matter be submitted to the executive board of the district, No. 21, which accordingly ratified the agreement.

The coal operators of Oklahoma recently took steps to form an organization in place of the Southwestern Interstate Coal Operators' Association, which has branches at Fort Smith, Ark., and McAlester, Okla. The Oklahoma coal operators objected to the size of the present organization and urged that the commissioner, who had his office at Fort Smith, could not look after the operators' interests in Oklahoma as they believed they should be attended to. To meet this objection Acting President William Dalrymple announced that James Kerr, of Lehigh, Okla., would be appointed deputy commissioner for the association and have charge of the affairs of the Oklahoma operators. His office will be at McAlester, Okla., but he will work under the direction of Commissioner Bramlette, of Fort Smith, Ark. McAlester and Fort Smith are about 102 mi. apart by rail.

Many Candidates in Southwestern Elections

On Monday, Dec. 26, District 21, which comprises the States of Texas, Oklahoma and Arkansas, cast ballots for the election of district officers for the ensuing term. The vote was by referendum and so was cast in the various district locals. The results will not be known for some time, as there are several candidates for each office and none appears likely to secure an overwhelming vote.

For president there are six candidates: William McLackIan, Huntington, Ark.; Jeff Thurston, Adamson, Okla.; J. D. Murray, Midland, Ark.; Gus Sparling, Gordon, Tex.; James Campbell, Coalgate, Okla., and Cat Atkinson, Huntington, Ark. There are no less than 27 who are after the vice-presidency, and 21 to whom the office of secretary-treasurer appeals. So many believe themselves fitted that the race is hard to forecast.

The charges against Peter Hanraty, the former president, and B. F. Gowing, the former vice-president, caused them both to be dropped as candidates and formed one of the reasons for the large open field.

Illinois mines do not run after so many idols, Frank Farrington being reëlected to the presidency of the district without opposition. Apparently Frank Hefferly, of Collinsville, will be vice-president, and Duncan McDonald, of Springfield, the fiery orator, is reëlected to the secretary-treasurership.

More Unreliable Forecasts of the New Scales

The story is circulated that the union will demand in the anthracite region the recognition of the union and the check-off: in the western Pennsylvania region, the mine-run scale. Ohio is to be given the same scale as last year if the operators can be induced to assent to its mine-run provisions.

But the Sunday Creek Coal Co. in the Hocking Valley is determined to get a readjustment of conditions. Its determination is shown by its idleness when all the other plants in the Hocking Valley are working. About 2,000 men in the district are receiving strike pay, and the number is even likely to be further increased. About $60,000 has been paid to striking miners of the Sunday Creek Coal Co. during the past five weeks.

This company has been expending thousands of dollars in making improvements, and it is believed that this is being done in anticipation that it will secure from the miners a radical reduction in wages and important changes in working conditions. On Jan. 11 District No. 6, comprising the mine workers of Ohio, will convene at Columbus.

An odd injunction has been secured by the Superior Pocahontas Coal Co. against McNeil and Goodson by which it hopes to defend its feudal rights over its mine workers. It desires to prevent the defendants from selling and delivering goods to its employees at its mines at Davy, near Welch, W. Va. Cook, Litz & Herman, of Welch, represent McNeil and Goodson. The company would do well to oust all competitors by reasonable charges rather than by an appeal to legal rights, which even if unassailable it is not well to press.

Will Cost Operators $10,000,000 Yearly

The new Pennsylvania compensation law will involve the operators in an expenditure for liability of about $10,000,000 a year, about equally divided between anthracite and bituminous districts. Some of the beneficiary insurance funds to which operators and mine workers both contributed will close their books on Jan. 1, notably the Philadelphia & Reading Coal and Iron Co.'s Miners' and Laborers' Beneficial Fund. There are about 600 beneficiaries who will, however, still draw benefits for some time.

Expressly excepting the Philadelphia & Reading fund, of which "Coal Age" has no information, it may be said that some of these funds have been based on the anticipated continued coöperation of both the operator and the mine worker, and some may find there is a shortage when obligations are met, now that collections are not being made of the mine worker; for though there will be no new obligations, those already incurred carry forward beyond Dec. 31, 1915.

In fact, the Lehigh Coal and Navigation Co. fund already has a deficit, which it is probable the company will have to stand. That deficit, if payments to beneficiaries are continued, will be increased during the year, and the company will feel obliged to meet both these charges and those of the compensation act.

The insurance funds now being established will be on a stronger footing, it being supposed that every year's deductions will on the average pay all the indemnities for the year's accidents, so that the full obligations of the year, immediate and deferred, will be met by the year's assessment and a company can withdraw from a fund at any time, leaving it with enough to take care of all liabilities incurred prior to that time.

Coming Meetings

Second Pan-American Scientific Congress will be held Dec. 27 to Jan. 8, at Washington, D. C.

Western Society of Engineers' annual meeting will be held in Chicago, Ill., Jan. 12. Acting Secretary, E. N. Layfield, Chicago, Ill.

American Society of Civil Engineers' annual meeting will be held in New York City, Jan. 19-20. Secretary, C. W. Hunt.

United Mine Workers of America will hold its annual convention in St. Louis, Mo., Jan. 17 and continuing for three weeks. Secretary-Treasurer, William Green, 1102 Merchants National Bank Building, Indianapolis, Ind.

The New Year and Coal Age

The editorial plans of *Coal Age* for 1916 cover an educational campaign that will be more interesting and more instructive than any previous year. Next week comes our big "Annual Review Number," which will contain articles from our correspondents and state mine inspectors in every important coal center. This number is the one you will file on your desk for handy reference when in doubt as to facts or figures concerning the industry in 1915. We will make an announcement in this Annual Review Number covering the subjects that will be dealt with in the next couple of months.

Who's Who in Coal Mining

E. R. Pettebone

E. R. Pettebone, commonly known to his associates as "E. R.," general superintendent of the coal department of the Delaware & Hudson Co., has been an anthracite engineer for 27 years. He was born in Kingston, Penn., 52 years ago, or to be more explicit, on the day of the battle of Lookout Mountain. As to ancestry, he comes as near being a real American as anyone but an Indian, for the first Pettebone came over to this country in 1642.

After attending the common schools, he went to Wyoming Seminary. Then in 1885 he joined the staff of Ira Hartwell of Wilkes-Barre, one of the oldest and best-known engineers of the anthracite region. The winter of 1886-'87 was spent in the Allegheny Mountains, surveying a route for the Continental R.R. This was one

E. R. PETTEBONE, GENERAL SUPERINTENDENT, DELAWARE & HUDSON COAL CO.

of the railroads that was never built. It had first been projected as an air line between New York and Chicago. The work done by Mr. Hartwell and his associates was the finding of a short but practical route through the mountains. This, however, would have cost too much, and the project was abandoned.

In 1886 the line of the road from Wilkes-Barre to Harvey's Lake was surveyed by Mr. Pettebone, who was still on the force of Mr. Hartwell, and in 1887 the North St. Bridge at Wilkes-Barre was built. For a few months in 1888 Mr. Pettebone was a member of the staff of H. S. Reetz, another private engineer.

In September, 1888, he joined the engineering corps of the Lehigh & Wilkes-Barre Coal Co., of which H. P. Phillips was superintendent, as assistant chief engineer. A year after this W. J. Richards, now president of the Philadelphia & Reading Coal and Iron Co., became chief engineer, and Mr. Pettebone was his assistant for eight years. Mr. Pettebone has contributed his full share to the good surveying work of the anthracite district, which deserves more fame for its extent and accuracy than the modesty of its engineers has permitted.

In 1897 C. C. Rose, who appreciated Mr. Pettebone's ability as an engineer, induced him to come to the Delaware & Hudson Co. as engineer of mines. In this position he had charge of all inside operations south of Scranton. In 1906 he was made chief engineer of mines, having charge of all inside operations. The scope of the work had meanwhile been increased by the addition of the collieries of the Hudson Coal Co. in 1901.

In April, 1915, he was made assistant superintendent of the coal department of the company, and in October, following the death of Mr. Rose, who had been general superintendent, he was made general superintendent of the coal department. He is also assistant general superintendent of the Hudson Coal Co.

In explanation of the situation it may be said that the Hudson Coal Co. purchases the coal mined by the D. & H., prepares it and ships it. The D. & H. is one of those pioneer railroads in the anthracite district whose charters allow them to mine coal.

Mr. Pettebone is a member of the American Institute of Mining Engineers, the Engineers' Society of Northeastern Pennsylvania, of which he is a past president, the Westmoreland and Franklin clubs of Wilkes-Barre and of a few local country clubs. He is a prince of good fellows and is popular with his employees—a fact that was proved by the joy shown by his men when the recent announcement of his advancement to the position of general superintendent was made known.

The Lehigh Valley Builds Many More Messhouses

There are now more than a dozen messhouses built of hollow terra-cotta tile at the various collieries of the Lehigh Valley Coal Co., and three more are in course of construction. The design of these buildings, which are used as clubhouses by the colliery employees, has been standardized, and their construction is to be extended to all of the 34 collieries of the company.

When the first messhouse for outside employees was opened at the Prospect colliery in January, 1913, it proved an immediate success. A careful study was made of the views and needs of the men who congregated there to eat their lunches, relax and talk, and the standard design was then adopted.

The new houses are 40x25 ft. and 12 ft. high. There is not a stick of wood in their construction, and they are absolutely fireproof. The hollow terra-cotta tile is covered with plaster inside and out and presents a pleasing appearance. The sashes of the doors and windows are of steel, and the gable roofs are of corrugated asbestos laid on metal.

The houses contain a messroom with tables and benches, showers and wash basins with hot and cold water, sanitary conveniences and a locker room for the men's working clothes. Their sides are almost entirely of glass, and they are scientifically ventilated and are heated with steam from the boiler houses, so they have plenty of light, air and heat. Each one is in charge of a caretaker who keeps it clean and in order.

Editorials

The Attitude of the Unions

Much of the past history of the United States and still more of the future history, albeit unknown to the chroniclers, has been and will be bound up in the attitude of the unions. Let us never overlook the great effect for good or evil they can and will exercise. Seeing that about half the miners belong to the United Mine Workers of America, we cannot believe that on the whole its action will not be eventually good. In such a large proportion of the men there must be elements of a generously constructive nature.

When we note the large number of mine inspectors and operators who have come from its ranks, many of them for a long time leaders in its counsels, under its present or under some earlier name, we cannot doubt that even today there is in it a large amount of idealism, patriotism, intelligence and character. Dregs there doubtless are, but if these settle to the bottom, the amount of clear liquid in the mixture will be a surprise to us all.

Every little while we see evidence of union men awakening their organization to the importance of first aid, safety first, discipline and social service. The union is taking on a new character—the character of its members. The nature of these men is essentially honest and just, and these qualities will eventually make themselves apparent, but they must first be recognized and encouraged. Occasionally sinister qualities will appear, the result of false leadership and the outcome of the narrower minds which such a large body of men must always contain. But we have a right and a duty to assume that a body as large as is union labor has a fund of honor and virtue which in the long run cannot well be either suppressed or overlooked. If there is not in such a representative body something good and helpful, then indeed we may look with apprehension at the future history of the nation.

State-Board Versus Old-Line Company Insurance

The formation of the state insurance board for the purpose of underwriting the employers' liability risks is possibly a harmless form of socialism, not at all to be condemned if successful. But its success must be attained on its merits. It should not be endowed by the state, so that through its privileges it can underbid private institutions.

No one would be seriously disposed to criticize if one of its sources of economy were to use the service of the inspection officers of the state, such as form part of the Department of Mines of Pennsylvania, though it may well be questioned if those grievously overworked forces can hope to shoulder yet other duties in addition to those now attempted. In fact it is stated that it is already arranged that the state use the services of the Associated Companies' inspectors to perform that preliminary and later inspection work by which are rated the hazards of the various coal mines.

It is doubtful—extremely doubtful—whether the state will be able to sell insurance at a figure below the Associated Companies without calling for help from the state or for assessments from the assured. This is especially true because the Associated Companies have put a 25- instead of a 42½-per cent. carrying charge on their policies. The state board rested its hopes to pay a dividend, or at least to do business on an 10-per cent. lower basis than that of the Associated Companies, on the fact that the rate would be nearer the larger figure. The actuaries are trying, or were trying, to induce the Associated Companies to raise their carrying charge to a higher percentage, so that the rate for the association would be $3.83 per $100 of payroll in the bituminous regions and $4.75 to anthracite concerns. The figures the Associated Companies have favored have been $3.57 and $4.33 respectively.

It is a new and strange duty for public servants to be trying to increase the rate at which a service shall be rendered to the public. If the Associated Companies were a small concern with limited funds, it would perhaps be comprehensible and even commendable, but as it is, the only purpose of the state board seems to be to underbid the Associated Companies, thus establishing themselves in the public goodwill.

Judging by the action of the state board, it may well be anticipated that if the Keystone State owned a railroad paralleling the Pennsylvania R.R., it would forthwith make up its mind that the private company was not making money enough. It would seek to compel the railroad to charge 10 per cent. more, so that it could sell transportation at the original figure and take the business away from the Pennsylvania R.R. And it would hunt, as does the state board, for plausible reasons to explain its action.

The board's actuaries say that 42½ per cent. is a necessary loading for the cost of carrying insurance, regardless of its character. They refuse to recognize the fact that the wage rolls of coal companies are so large in comparison to the needed expense for solicitation, management and inspection that the business can be carried at a low figure. They declare that the intention of the Associated Companies is to square themselves for their coal-mine losses by their profits in the underwriting of other forms of liability, and that, as acting for the state as a whole, they cannot countenance such a shifting of the burden. But it appears evident that the cost of doing business will hardly be less with the state board than with the Associated Companies. Every evidence seems to show that the state board will write little or no insurance, unless it uses the usual methods of solicitation, and that it is the old-line companies which can avoid the cost of the canvass and to whom the business will come without seeking.

The costs of management of the state board may be a little less, and that management is certain to be less expert and more political. The inspection as made by the employees of the Associated Companies for the state board

will not cost less than when made for that association, though the service will be semiannual instead of quarterly. Consequently there can be little hope that the state board will be able to underbid the old-line companies unless it does it by forcing up their rates.

J. W. Leach, a member of the new Workmen's Compensation Board, on Dec. 21, told the banqueters of the Coal Mining Institute of America at Pittsburgh, Penn., that the basing rates for the state board would be $3.45 in the bituminous region and $4.28 in the anthracite and that the Associated Companies would charge as stated $3.83 and $4.75. But he omitted to say that the association had not filed these rates and consequently the state board could not approve them. The state board has only power to accept or reject a filed rate, and the Associated Companies stand firm to the rates $3.57 and $4.33. Up to the present no decision has been reached.

It is clear that the state board is about to take some further excursions into the domain of legislation. It is not contented with the granted power to accept a fair rate and reject one that is unfair. It desires to compel that such a rate be placed by the Associated Companies as it can underbid successfully. If insurance can be safely written for $3.45 and $4.28 by an institution backed by $300,000, surely an association backed by millions of dollars can do business at the higher rates of $3.57 and $4.33 with safety to itself and its insurers.

The public, at any rate, confident that it is satisfactorily secured, demands that the state board give it a chance to be insured at the rates offered. If anyone is going to lose by the rates submitted, it is not the miners or operators of Pennsylvania, but certain capitalists in America and Great Britain. If they lose by their low rates, it is their own private matter and does not concern in any way the state board.

As a matter of fact, if the Associated Companies had named $5 and $6, the same tactics would have been followed. The board would have called for $5.55 and $6.66, so that the state fund could safely charge 10 per cent. less and still conduct its underwriting at the figures determined by the old-line companies as safe.

The state board was instituted to lower insurance rates; it is a monstrous violation of its trust if its sole action is to raise them.

Speculations or Investments

The discussion on "Uniform Accounting and Cost Records as Applied to Coal Mining" at the West Virginia Coal Mining Institute meeting, Dec. 8, revealed the fact that many operators were in doubt whether they were engaged in the business of producing coal or in a speculative real-estate venture. The rapid development in the coal business and the competition for the coal lands available, especially those where freight and wage rates are favorable, have made it possible in many cases to mine and sell coal at a loss and still withdraw with a profit by the sale of the real estate remaining.

It might be anticipated that this speculative element in coal mining would before long come to an end as the value of the coal land reached a certain limit. But there does not seem to be any end to the rise in values, as may be seen by the high prices demanded for anthracite coal in the ground. The only places where such increases in value are not occurring are where wage rates are high and inflexible, where mining scales forbid effective and economical recovery and where railroad rates are high and arbitrary.

There the tendency is to keep the price of land at a level or to decrease it in value year by year. He would indeed be a juggler with figures who would under such conditions add to the book value of his lands the interest on the investment, the taxes and the administrative charges. In such places these all have to come from operating earnings or are partly recovered from the renting of the surface rights.

Unfortunately the coal business cannot be kept free of the speculative element. The uncertainty of the mining conditions, the fluctuation of wage and freight rates, the opening of new coal fields, all give a certain element of uncertainty. The only hope to sell a mine rests in its continuous operation. For this it is not absolutely necessary to make a profit. If the mine is operated, the public—even the mining public—will argue that the operator must be making barrels of money.

There is no property known which depreciates so rapidly on being closed down and shows the effect of idleness so markedly as a mine. Everything in coal mining is predicated on a life of steady operation. The tipple and shaft or drift timbers will barely last till the coal is exhausted; the rock dump will not be traversable if some of the bents are not jacked up once a week; the coke ovens will need repair and almost rebuilding if allowed to cool down; the rooms and headings will flood if the pumps are not kept running every day. It often happens that there is an option between avoiding the bankruptcy court for a year by operating at a loss or being closed out by the sheriff inside of six months as a result of shutting down.

A well-built factory can be closed for two or more years, yet only a few dollars of repair will be necessary for either building or machinery. But the mine will take six weeks of preliminary work inside and out, and sometimes the repair work cannot be done so rapidly.

Opinions Differ

There is no accounting for a man's point of view, just as there is no accounting for a man's taste for oysters or olives. Sometimes we like something because we want to like it or because it is more advantageous to like it. In the same way our dislikes and our prejudices are frequently formed to fit personal conditions.

One day we get a letter from some reader complaining that the union is a good thing and that we do the industry an injustice in carrying out a policy of antagonism to the union. All we can invariably do is to reply that we are not opposed to organized labor and that we exert every effort to be fair. We always invite our critic to send us his views, and we assure him that they will be published.

The next day comes a letter from another reader calling us a "labor organ." Here's one of the latter kind that came today: "I consider *Coal Age* a paper for labor-union officials and not for coal-mine operators. While your journal contains a large volume of reading matter for mining men, it also unfolds business methods of coal operators that should not be made public."

Truly, the path of the editor is a thorny way.

Discussion by Readers

The Union Yet To Be

The brief editorial on the above subject, *Coal Age,* Dec. 4, p. 938, suggests the thought that if the idea therein mentioned were carried out, there might result great improvement in the conduct of union affairs. My experience in connection with the conduct of union operations has been that in many cases—I may say, in a large majority of cases—the local unions are dominated by the young, unmarried hotheads who have no family ties or responsibilities and who care not whether they have peace and harmony or strife and strikes. In fact, they prefer the latter. Having no one dependent on them a strike brings a season of idleness when they can loaf around with a good excuse till their money is spent, and then move on to some other operation and repeat the performance.

Many men of this caliber prefer part-time to steady work and will frequently lay out even when work is steady, provided they can hold their places. In many cases the steady, sensible, conservative men stay away from the local-union meetings rather than attend and listen to the ravings and rantings of the class of men I have mentioned. Experience has taught them that if they do go and suggest any sensible idea, they are called "blacklegs" or "scabs." Any one familiar with industrial operations of any kind well knows the aversion of the average workman to such appellations.

I heartily indorse the suggestion that if the operators or superintendents can and will induce their sensible, conservative employees to attend all the union meetings and speak their minds and vote their preferences, there will be a much greater degree of peace and harmony. Sensible, conservative men would then be elected to the local offices instead of the radicals now too often filling them. The editor's incidental remark at the close of his short comment should also be taken to heart—that the operator do his part in the harmony program; for the radicalism of the employees is too often caused by radicalism and unfairness on the part of employers. I am glad to say, however, that this order of things seems to be giving way to a broader viewpoint on the part of coal operators.

EDWARD H. COXE.

Knoxville, Tenn.

Mine Officials' Brotherhood

Letter No. 1—I was glad to read the short article, *Coal Age,* Dec. 25, p. 1067, relating to the organization known as the Mine Officials' Brotherhood started about a year ago in Pennsylvania. I believe every mine official who reads the article will agree that such a movement should have been started long ago. There are too many mine officials in this state not to have formed an organization that would bring them into closer contact with each other.

One can but hope that all mine superintendents, foremen, assistant foremen, firebosses and others will see at once the benefits to be derived by getting together and discussing problems of mutual interest that arise daily in connection with the mining of coal. Such an organization will doubtless prove of as great benefit to operators as to the officials in charge of their mines, by making them better acquainted with superintendents, foremen, firebosses, etc., who are capable men. As stated in the article, the organization will also keep its members informed in regard to operations in need of men.

The insurance feature explained in the article will undoubtedly attract many members, and I believe it will be but a short time before the membership will be large enough to pay the full death benefit of $2,000 to the beneficiaries of any of its deceased members. It may even be possible to pay in addition a weekly benefit in case of sickness or disability whereby a member would be kept off duty for a given length of time.

Permit me to suggest that an organization of this kind should have headquarters at a certain place and in time establish subdistricts or branches at convenient localities where mine officials would have an opportunity of meeting and discussing questions pertaining to mining.

Now that the movement is started, I hope it will meet with the hearty approval of all mine officials and that they will coöperate for its success.

OLIVER YOUNG.

Nu Mine, Penn.

Immigration in the Future

Letter No. 1—Some months ago there was conducted in the columns of *Coal Age* an interesting discussion in regard to the foreigner in mining. There was, if I remember correctly, a wide divergence of opinion as to his necessity and desirability. This, however, was before the Italian and Greek Governments called to their respective colors their numerous reserves employed throughout the mining districts of America.

The consequent decrease in the number of foreigners due to these calls, while by no means eliminating them as a factor in the mining industry, has nevertheless reduced their number in many instances to the point where it is possible to get a somewhat clearer conception of what it will mean to carry on the coal industry without them. If the foreign laborer is necessary and desirable to American industry, we ought in justice to him to so establish the fact that he will be freed from the frequently reiterated accusation of being a drawback and a burden to American prosperity and progress. If it is true that his presence here works a hardship on American industry and labor, steps should be taken to remedy the situation.

It seems to me that the present is a particularly opportune time to take the matter under consideration. The recent address of President Wilson to Congress seems to suggest the possibility of an alteration of our naturalization and immigration laws while Congress is in session.

Eminent authorities hold that at the termination of the European War there will be an unparalleled influx of

foreigners to our shores—despondent, destitute, needy, their sense of morality warped by memories of the past and the hopelessness of the future, their intellectual faculties deadened and brutalized by the scenes they were compelled to witness and the deeds they performed and their bodies weakened and diseased by exposure and unsanitary environment. It is claimed that their coming will be fraught with deadly peril for both American industry and American labor.

Other authorities just as eminent and no doubt just as well qualified to judge argue that at the end of the gigantic struggle American industry will be paralyzed by the unexampled exit of foreign laborers who will return to the land of their birth to help rebuild their devastated countries and to enjoy the society of their fellow countrymen who will have been spiritually ennobled and morally strengthened by their patriotic sacrifices.

I will, at present at least, offer no suggestion as to the possible truth of this situation, but would like to see the subject fully discussed, as I believe that if there is to be any change in our immigration laws or if a change is desirable, the coal-mining industry, being perhaps chiefly affected, should take a part in recommending such legislation as it considers proper.

——, W. Va. FLAT TOP ENGINEER.

Synchronous Motor-Generator Set vs. Rotary Converter

There appeared in *Coal Age,* Oct. 30, p. 707, an article entitled "The Rotary in Mine Work," which was written by a mining engineer of recognized ability, but which treated the subject in a general way. While not desiring to criticize the article, I wish to correct as far as I may be able the wrong impression that the sweeping statements it contained would naturally create in the mind of the operating engineer.

While I fully believe that the rotary converter is an efficient and thoroughly practical machine, I do not believe that its use is universal in preference to a synchronous motor-generator set. There are cases where a rotary converter will prove a more desirable machine to use, but again there are cases where a synchronous motor-generator set is better adapted to the work in hand.

EXAMPLE OF LONG-LINE TRANSMISSION

As an instance showing the correctness of this statement, let us take the case of a local mine that is operating quite a distance from its source of power. If the operator installed a rotary converter on the end of a long line, he would apparently secure higher efficiency for about the same cost, but, on the other hand he would have no compounding available on the direct-current side, the machine would be subject to "flashovers" due to inductive effects and his voltage would drop with each peak-load condition.

It has been repeatedly shown that where a rotary converter is installed at the end of a long line there is going to be trouble, which will not be pleasant for the man interested in output. A synchronous motor-generator set installed at the end of this line will not only be independent of the alternating-current voltage conditions and inductance, but it will be possible to go a step farther and correct the power factor, thereby improving the service. On the direct-current side the operating engineer may use any degree of compounding necessary and he will have no trouble from sparking when starting or from bucking or flashing by reason of overload.

COMPARATIVE ADVANTAGES AND DISADVANTAGES

I would also call attention to the efficiency curves given in the article to which I have referred and ask whether the author of the article has ever seen a 200-kw. rotary converter with its accompanying transformers that gave an overall efficiency of 96 per cent. It would seem to be more in the neighborhood of 90 to 91 per cent. at full load, and this is what the consumer pays for. I am of the opinion that up to the present time the rotary converter has not been perfected to the point where we can avoid excessive sparking at the brushes during the starting period, unless it be equipped with a special brush-lifting device, or can get compounding or constant-voltage, or with a special booster arrangement, which will increase the cost and drop the efficiency.

The rotary converter also requires on the whole a more skilled operator, because the operating characteristics are more complex and less easily understood by the average man around the mines. On the other hand the synchronous motor-generator set is easily understood and can be handled by disabled men past the years of active service, who can be pensioned by the mine company by giving them a job in a substation of this nature.

The rotary converter is a thoroughly good machine for certain conditions and classes of work, such as are to be found with large mining companies having their own central stations and skilled engineering corps that can give constant attention to the training of attendants, and also where the lighting service of consumers will not be disturbed by the rotary peaks and inductive line shocks, which cannot be corrected in the use of this type of machine.

Therefore, I would take issue with the writer of the article by asserting that the synchronous motor-generator set has fully as many uses as the rotary converter and is decidedly more satisfactory to the average mine operator or trolley company, which rapidly loses sight of efficiency when it has trouble.

A. R. MEEK,
Ridgway, Penn. Electrical Engineer.

Keeping Mine-Supply Accounts

A writer, in a recent number of *Coal Age,* declared himself in favor of the book known in office parlance as "the jumbo." This book is aptly named, as its size is out of proportion to its usefulness to the bookkeeper. The average mine-supply house has between three and four hundred items on its books, and allowing one page to each item, one can readily see that a single ledger would be very cumbersome.

Where different kinds of machine repairs are kept in the storehouse, it is a safer and easier method to devote a section of the book to each department. Gasoline locomotives, for instance, would have a section devoted to their repair, and other engines and machinery likewise separate sections. Then a part will have to be given to the supplies kept and sold, and this section should show not only the amounts on hand, but the current retail price with the cost price.

The "jumbo" is too top-heavy for quick use, and one coal company has found a loose-leaf system to fill its needs in a satisfactory manner. The increased cost of labor and with it the increased cost of material is making the storehouse an important part of the colliery organization. I would go beyond the price of the supplies bought and advocate the keeping of records that will show the service that each material gives. Too many supplies are bought solely on the basis of price and often reach the operating officials of the colliery with their usefulness already impaired. The purchasing department is not in a position to know of the trouble and delay caused by the failure of the material furnished, but such delays often occur, throwing the entire colliery force idle for a few minutes or perhaps an hour or more. When many men are idle a few minutes, the cost to the company amounts to a considerable leak.

A Concrete Example

Every colliery, no matter of what size it may be, could put in service records that will show the life of the supplies furnished. For illustration: A colliery may own several locomotives. The present practice is to run them into the shops in turn and repair them with no other record than the time spent on the repairs. If a sheet were kept by the shop foreman showing the repairs made, together with the condition of the engine when it reached the shop, a means of checking the material used would be at hand. For instance, this mine may be a place where the supply of lubricating oil furnished the engineers is reduced to the lowest possible amount. Then, when a locomotive comes in, the first examination in the shop may disclose the fact that the cylinders need to be rebored. This will be a costly job, entailing the change of piston rings to compensate for the increased diameter of the cylinder, and will hold the engine in the shop for a considerable time. This condition of the engine would lead one naturally to suspect the oil supply as the first cause. The engine may have worked on a grade, and the engineer, unable to get any but his allotted supply of cylinder oil, has been compelled to let his engine "holler" or grind the cylinders for want of oil. It would at once appear that either the quality or the quantity of oil for that particular engine will have to be changed.

Purchase of Inferior Material

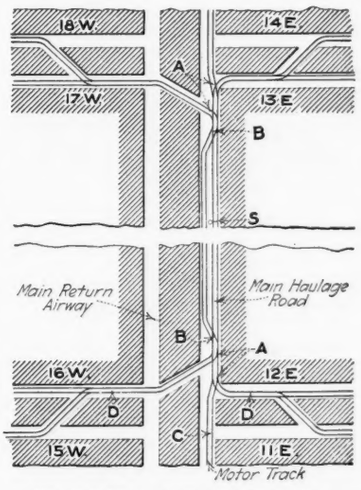
A low-priced and cheaply built steam valve may tie up a boiler room, or a poor hoisting rope may mean the loss of life and property. All these items are storehouse goods, and the storekeeper should be the custodian of the records and bring them to the attention of his boss to have them taken up with the purchasing department. Other instances will suggest themselves to readers, and the suggestions made here will doubtless appeal to many workers at mines where every effort is made to "cut" the supply bill, with an apparent blindness as to the cost such action entails. Where no supplies are on hand and a high-priced repair force must search for a long time to find enough material to finish a job, the cost item will be on the payroll and not on the voucher account. Between these two the latter is the less expensive, and appears the better on the cost-sheet. So that it is quite evident that a generous supply of dependable material is insurance against increased costs.

Maryd, Penn. J. Kenvin.

Motor Haulage and Side Tracks

Letter No. 1—I have read with great interest the two articles on "Motor Haulage and Side Tracks," *Coal Age*, Oct. 9, p. 580, and Oct. 16, p. 622. In my opinion this is one of the most essential considerations in coal mines where motor haulage is used. Although the several forms of side tracks shown in these articles seem enough to more than satisfy the requirements of the mines in this country, I believe it will be of interest to show a special plan of side track used in some of the mines in southern Illinois and which has invariably given much satisfaction.

The plan to which I refer has met with general approval wherever it has been adopted. The mines employ motor haulage on the main roads, while mules are used for the gathering haul on the side entries. As shown in the accompanying figure, the main-entry parting, where trips are made up to be hauled out of the mine by the motor, is located between two consecutive pairs of cross-entries and is thus made to serve four pairs of entries, two being driven to the east and two to the west of the main entries. The arrangement shown in this plan is for a practically level seam, rooms being driven off both entries of each pair. As shown in the plan, switches (A) leading to each pair of cross-entries are laid in the main track. Just inside of these switches are the switches (B) for the empty track of the parting.



PROPOSED ARRANGEMENT OF SIDE TRACK

At a point marked *C* on the plan is a trolley switch that is operated automatically by the passage of the motor, whereby the power is thrown on or off the parting as the motor enters or leaves the same. The arrangement is such that the operation of the trolley switch *C* turns on the red lights *D* near the mouth of each pair of cross-entries. These red lights warn any approaching drivers that the motor is on the parting, and the driver stops and waits until the track is clear. At the center of the parting is a board marked "stop," which shows the drivers from each end where to place their first car. These are coupled together, and other cars are coupled to them as they are brought out from the side entries, so that there is no delay when the motor reaches the parting and sets in the empty cars and pulls out the loads.

Assuming that there are 14 men working on each pair of cross-entries, by this plan 56 men can be served by six mules, three at each end, thus saving the expense of feeding and maintaining from two to four mules and at the same time avoiding much annoyance and delay in getting the coal to the parting and making up the trips for the motor.

I do not wish to be understood as recommending this as a standard method, but I think it is worthy of consideration by all coal-mine operators, and I would like to see the advantages and disadvantages of this method discussed by the readers of *Coal Age* with respect to its adoption under different conditions in different states.

Eldorado, Ill. OSTEL BULLOCK.

Efficient Mine Foremen

Letter No. 15—After reading the letter of Assistant Mine Foreman Young on this subject, *Coal Age,* Nov. 27, p. 898, I want to suggest that he seemingly forgets that the bread-and-butter question has generally a lot to do with a mine foreman's actions. It is not so much what he knows or what he may desire to do in performing his duties in the mine as what he is able to do in carrying out the law and working the mine in a safe and sanitary manner.

As far as the mine foreman is concerned, the proposition is practically one of maintaining a big output and keeping down the cost of operation. Under the prevailing conditions today it is quite the exception to find a foreman who is able to handle the mine in his charge in strict compliance with the mining law and continue to hold his position. The attempt to do this has caused many a mine foreman to be blacklisted.

RESPONSIBILITY NOT WHOLLY THE MINE FOREMAN'S

This may not sound good to Assistant Foreman Young and some other mining men who seem to think that the high cost of production and other similar responsibilities rest wholly on the shoulders of the mine foreman. But the cold truth is in many cases—I might say in most cases—that the mine foreman who hides "gas" found in the mine or other dangers from the inspector is the one who stands the best chance of holding his place and drawing the highest pay.

In closing I want to repeat that it is not always what the mine foreman knows or what he doesn't know that is the cause of trouble, but rather what he is allowed to do, and the responsibility rests on other shoulders than his in such cases. Always, the responsibility should rest on the man who has the authority to control operations in the mine. The mine foreman should not be given this legal right unless in its exercise he can be protected from the unjust censure of his employer and its direful results. A FOREMAN.

——, Penn.

Letter No. 16—I want to mention three principal points that vitally concern the efficiency of a mine foreman in respect to keeping down the cost of the production of coal. These points are often overlooked by a foreman because he has his mind set and his whole attention concentrated on the one thought of securing a large daily output. He forgets that this cannot be done and men cannot work under unfavorable conditions or without tools. Neither can the large output be handled successfully in a mine that is not kept in good condition.

The points to which I refer are the following: (1) Good ventilation, conducted so as to keep the working places and the falls in a healthy condition and clear of gas. When this is done, men are better able to see the dangers of their surroundings and to load better coal by throwing out bone and other impurities. (2) Good roads are necessary in order that cars may be handled in the shortest possible time and with the least expenditure of labor. (3) Good drainage is equally necessary to keep the working places and the roads free of water and in good condition.

Besides these three main points that I have mentioned, there are numerous minor points that are overlooked by a mine foreman who lacks efficiency. To illustrate I will mention a few examples—things that I have observed in traveling around the mines and which greatly impair successful operation and help to increase the cost of production.

RESULTS OF INEFFICIENCY OF FOREMAN

A man having finished his place is sent to another and finding "no switch" goes home. Another man sent to a place finds "no rails" laid in the room and none to be obtained anywhere, and he goes home. Another man is sent to a place and finds it full of water and "no pump" nor any way of getting the water out of the place, and he goes home. Another is sent to a place where the conditions are bad—the roof caving or fallen or a "roll" at the face of the room. No one is there to tell him what pay he can expect for cleaning up the place or how much he will be allowed to go through the roll. Men met with such conditions do not start work, but leave the mine. Other men are hired to cut and load coal, but on going to a place find "no machine" or "no hose," and having no tools they cannot work. Often men are sent to places in which they are unable to handle cars or, again, are sent to places that they cannot find because they are strangers in the mine.

In all these cases the mine foremen knew or should have known the condition of each place to which these men were sent, and if extra pay or assistance was needed to start the men, this should have been given them. In a large mine it is no exception to find eight or ten men going home each morning owing to different causes, many of which could have been prevented with a little more foresight on the part of the mine foreman. This means a loss of from 40 to 60 tons of coal per day. The cost of operating the mine is the same as though these men had been at work, and as a result, the cost of production is increased.

WASTE OF MATERIAL IN MINES

I want to say a word here in regard to the waste of material in mines. It may not seem much of a loss when a spike is dropped on the road, a couple of props are thrown aside in the waste or a few sprags or a track tie is missing. Sometimes a rail or two are covered up, or a couple of pounds of copper wire; splice-bars and bolts are carelessly left in the place where they were used. These items seem small, but their cost is easily figured up and totals a considerable amount. They all help to increase the cost of production in that mine. In another letter I will give the number and cost of different materials found in a certain mine by the company inspector. These minor points vitally concern the efficiency of a foreman or any of his assistants, and careful attention to them will reduce the cost of putting coal on the tipple and make the operation successful. MINER.

——, Penn.

Inquiries of General Interest

Number of Men Employed Under New Mine Law

I want to ask if the new compensation law that goes into effect Jan. 1, 1916, affects the limit of the number of men that can be employed in a mine where a regular mine foreman is not placed in charge. I am under the impression that after the first of January the law requiring the employment of a "competent and practical mine foreman for every mine where ten or more persons are employed" will not be in force. In our mine we employ ordinarily eight men, but can work more during the rush season. I should be glad to be correctly informed in this regard. H. E. ALBERT.

Vandergrift, Penn.

Act No. 330 of the General Assembly of Pennsylvania, which was approved by Governor Brumbaugh on June 1, 1915, and which goes into effect Jan. 1, 1916, amends sec. 1, art. 4 of the Bituminous Mine Law (1911) to read as follows:

> In order to secure efficient management and proper ventilation of the mine, to promote the health and safety of the persons employed therein and to protect and preserve the property connected therewith, the operator or the superintendent shall employ a competent and practical mine foreman for every mine where 10 or more persons are employed, who shall be under the supervision and control of the operator. The mine foreman shall have full charge of all the inside workings and the persons employed therein, subject, however, to the supervision and control of the operator. . . . If the mine is nongaseous, the mine foreman must possess either a first-grade mine foreman's certificate or a second-grade mine foreman's certificate, or be a person who in the judgment of the operator is equally competent with the holders of such certificates.

The paragraphs quoted from the new law are those that bear on the answer to the inquiry of our correspondent. In our opinion there is nothing in the reading of this law that would permit the employment of more than ten persons in a mine where there is no mine foreman in charge. In the meaning of the law there must be a person employed as mine foreman who in the judgment of the operator is equally competent with the holders of such certificates as are granted by the examining board to successful candidates for that position. The law gives the operator of a nongaseous mine the privilege of employing as mine foreman the holder of a first-grade or second-grade mine foreman's certificate or any person whom the operator believes to be equally competent with the holder of such certificates, and when such a foreman is in charge of the mine, the operator is free to employ more than ten persons.

It must be admitted that the law is broad in this respect, as the judgment of the operator in regard to the competency of the man he employs as mine foreman will in many cases be prejudiced in favor of the man he desires to name for that position. The judgment of the operator in this regard will doubtless often be questioned by the mine inspector of the district; but under the new law we do not know that the mine inspector would have any authority to compel the employment of a more competent man. However, the mine operator is the responsible party in case of accident. In this regard there is a vagueness in the new law which seems to place limitations on both the judgment and authority of the state mine inspectors.

A Flooded-Mine Proposition

Referring to the inquiry, *Coal Age,* Oct. 16, p. 646, I do not fully understand the plan suggested by *Coal Age* in its reply. It is there assumed that water is flowing into the mine under a head of 100 ft. I would like to ask how it would be possible to grout the faces of the rooms as suggested, without having a strong bulkhead capable of resisting the pressure while the work of grouting is being performed. W. L. MORGAN.

East St. Louis, Ill.

As stated in the reply referred to by the correspondent, it is assumed "that the pumps installed are capable of draining these rooms and controlling the flow of water sufficiently to enable the erection of a strong timber bulkhead, say three or four yards back from the face of the coal, so as to confine the grouting run in through the drill holes in the space between the bulkhead and the face of the coal."

If the pumps, as here assumed, are able to handle the water, there will be no pressure due to a head of water acting on the bulkhead, which merely supports the fluid concrete until this sets. The concrete fills the entire space between the bulkhead and the face of the coal, the floor and the ribs in this space having been previously grooved or trenched in order to prevent an even joint through which the water would find its way. We would add, however, that a pipe, say 5 or 6 in. in diameter should be run from the hole where the water broke through, to the outer face of the bulkhead and provided with a good wooden plug that can be driven into the pipe to stop the flow of water after the concrete has set.

Emission of Gas from Strata

Is a fall of barometer accompanied by an increase in the flow of gas from the strata in mines?

Oskaloosa, Iowa. FIREBOSS.

The change in atmospheric pressure corresponding to a sudden fall of barometer is, at the most, very slight as compared with the pressures manifested by occluded gas in the coal formations. For this reason it cannot be assumed that gas flows out from the strata more freely during a period of low barometer than at other times. Observations made in mines, which have been taken to show an increased percentage of gas in the return airway under a low barometer, have failed to distinguish between the flow of gas from cavities in the strata and abandoned workings and that which flows from the pores of the coal or rock.

Examination Questions

Iowa Foremen's Examination Des Moines, Nov. 9-10, 1915

(Selected Questions.)

Ques.—A hole charged with black powder has been drilled a little on the solid, so that the powder only blows out the tamping. The miner wants to recharge the hole. What would you do as mine foreman in charge?

Ans.—The miner should not be permitted to recharge the hole the same as before or to put in a heavier charge of powder, as he is prone to do. There are two ways in which this hole can be blasted with safety: (1) If the hole has a good depth, it will be well to plug the bottom of it with fireclay to such a depth that the charge of powder will not lie on the solid. Then recharge the hole, using a moderate charge of powder only sufficient to break down the coal. (2) If the hole is not so deep but that the mining can be extended to reach the back of the bore, this should be done before recharging the hole. Also, any projecting tops should be cut away, so as to give the shot a good opportunity to perform its work.

Ques.—What would you do if you were a mine foreman and were notified of a serious accident to a miner owing to a fall of slate?

Ans.—Send word at once to the surface to make all necessary preparations for the removal of the victim of the accident and to summon a physician without delay. Then hurry to the scene of the accident, taking any available men to assist in removing the man and rescuing him if still alive. At the same time summon the first-aid corps to the place so that they can give what help may be needed.

If the man is alive, after he is removed from beneath the slate, his injuries should be treated as far as practicable by the first-aid men and he should be promptly removed to a place where he can have good air. For this purpose he should be carried on a stretcher or taken in a car to the shaft bottom. There should be in every mine a hospital where injured men can be taken and treated properly by a physician before being sent to the surface.

Ques.—Explain the difference in the action of dynamite and black blasting powder. Why is "F" powder sometimes used in preference to "C" powder?

Ans.—The explosion of dynamite is what is known as a "detonation," while that of black blasting powder is termed a "deflagration." In a detonation the explosive force is transmitted from one particle to another throughout the mass by a vibratory shock, the action being more sudden and violent than in a deflagration. In the latter case the force is transmitted throughout the mass by the combustion of one particle starting combustion in the particles in close proximity to it. This burning progresses quickly from particle to particle until a sufficient heat and pressure is developed to cause the explosion of the mass. The action in the latter case is much slower and less violent than in the former.

What is known as "F" powder has a much finer grain than "C" powder. The smaller size of the grain of the "F" powder makes its action quicker than that of "C" powder and as a result "F" powder is much stronger and quicker in its action than "C" powder. For this reason it is better adapted to blasting hard coal or rock, while "C" powder gives better results in soft coal.

Ques.—A hole is tamped with a charge of black powder. The shotfirer lights the fuse, but the shot fails to go off. What would you do if you had men under your charge waiting for the shot to go off before they could begin work?

Ans.—A fuse may hang fire anywhere from a few minutes to several hours, and for that reason it is unsafe for anyone to approach the place to ascertain why the shot did not go off. The men should be put to work in other places or else sent home, and no one should be permitted to enter the place during that shift.

Ques.—A sump in a mine is 40x10x10 ft. in size and fills with water every 24 hr. The water is pumped directly to the surface, a height of 200 ft., through a 5-in. pipe. If the pump is 75 per cent. efficient and the friction losses of the water flowing through the pipe are neglected, what horsepower will be required to pump the sump dry in 8 hr., with water flowing into the sump as it is being pumped out. Assume that 1 cu.ft. of water weighs 62.5 lb.

Ans.—The capacity of the sump is 40x10x10 = 4,000 cu.ft., and it holds when full of water $4,000 \times 62.5 = 250,000$ lb. The weight of the water running into the sump is then $250,000 \div (24 \times 60) = 173\frac{5}{6}$ lb. per min. In order to empty the sump in 8 hr., or one-third of the time in which the sump fills, the pump must handle $3 \times 173\frac{5}{6} = 521\frac{1}{2}$ lb. of water per minute, assuming that no water flows into the sump. When water is flowing into the sump, however, the pump must handle $521\frac{1}{2} + 173\frac{5}{6} = 695\frac{1}{3}$ lb. per min., through a vertical height of 200 ft. Then, ignoring the friction in the pipe and taking the mechanical efficiency as 75 per cent., the horsepower required for this work is

$$H = \frac{695\frac{1}{3} \times 200}{0.75 \times 33,000} = 5.62 \textit{ hp.}$$

Practically the same result is obtained by finding the inflow into the sump in gallons per minute; thus

$$G = \frac{4,000}{24 \times 60} \times \frac{1,728}{231} = 20.78 \textit{ gal. per min.}$$

Then, under the given conditions the pump must handle four times this amount of water in order to empty the sump in 8 hr. when water continues to flow into the sump. This gives

$$4 \times 20.78 = 83.12 \textit{ gal. per min.}$$

The horsepower required to handle this quantity of water each minute through a height of 200 ft. is then

$$H = 0.00034 \times 83.12 \times 200 = 5.65 \textit{ hp.}$$

This formula allows for an efficiency of 75 per cent. in the water-end of the pump.

Book Reviews

How the British Mine Coal

BRITISH COAL TRADE. By H. Stanley Jevons, professor of economics, University of Allahabad, formerly Fulton professor of economics and political science at the University of South Wales and Monmouthshire. E. P. Dutton & Co., New York City. Cloth boards 5x7½ in. pp. 11 + 863 + 12 index. 23 illus. and 2 maps. Price, $2.25.

This is one of the National Industries Series which includes a volume on "British Shipping," a "History of Inland Transportation and Communications," "The Industrial History of Modern England" and "English Railways." It is written by a man who has an excellent knowledge of his subject and a reputation as an economist. If we do not mistake, he is the son of William Stanley Jevons, who had an international reputation for his work in logic and political economy. H. Stanley Jevons writes in an interesting manner, and his work while not highly technical will be found enlightening even to the mining man.

MUCH DISCUSSED AND BEDEVILED WELSH MINER

His remarks on the Welsh miners are quite interesting at this juncture:

Although there has been a large immigration of Englishmen and Irishmen, and to some extent of Italians and Spaniards, to the Welsh mining valleys, the population is still predominantly Welsh. The short, wiry build and the dark hair of the Welsh miners proclaim them a race distinct from the English. Welsh is the everyday language in the majority of their homes, and a stranger may constantly hear it in the streets and in trains or trams. In temperament also the Welshman is distinct from the Englishman. There has been throughout the Nineteenth Century, and still is among the older miners, an extraordinary religious fervor. They are practically all Nonconformists, chiefly Methodists or Baptists; and the numerous chapels to be seen in the valleys have been built chiefly out of the savings of the miners, sometimes actually with their own hands in their spare time.

During the past 15 years, however, there has been a distinct falling off in attendances at the chapels, and the younger generation is growing up imbued mainly with socialistic and political aspirations. To many of them the "war against capital" has become almost a religion; and in the Rhondda and adjoining districts—particularly in the better-paid, fully developed parts of the coal field—have grown up several schools of thought in socialism and syndicalism which have already to some extent made themselves felt in English life in the national coal strike of 1912 and are likely to have an increasing influence in the British labor movement, and eventually in Parliament. The Welsh miner of the older valleys is temperate, industrious, thrifty and intelligent. Since the Eight Hours' Act came into force, there has been considerably increased activity in evening continuation classes, the Workers' Educational Association and in local government election campaigns, the miners now controlling many of the local district councils.

CONTINUAL INDUSTRIAL UNREST IN SOUTH WALES

The peculiar Welsh temperament, essentially imaginative, intellectual and impatient, manifests itself continually in industrial unrest. Local disputes at the collieries, with strikes lasting a few days, are of constant occurrence, and the causes often appear comparatively trivial, at least they do not seem to call for such a drastic remedy. The men often strike, too, in defiance of the order of their miners' agent and of their district committee. They are just as impatient and irksome of restraint by their own leaders as they are of any arbitrary action on the part of the management. I have heard it said by colliery proprietors in other parts of the country that they will not employ the most skilled miners from South Wales, useful as they might be, because they are so imbued with socialistic principles and try to persuade the other workmen to think they ought to have the management of the mine in their own hands.

WHY NOT SEND THEM SOME PIT WAGONS?

Speaking of the Durham and Northumberland field Professor Jevons says:

The whole coal field is well and almost exclusively served by the North Eastern Ry., which in many ways is more enterprising than any other line in handling coal for export. The company has introduced trucks of 30 and 40 tons' capacity to replace the old 10- and 12-ton wagons, and it uses very powerful locomotives. It is now experimenting with electric haulage for mineral as well as passenger traffic.

This all bears out the editorial in "Coal Age," of Nov. 6, p. 762. It shows how much need exists for larger methods in Great Britain. In 1900 the Pennsylvania R.R. dumped and burned all gondolas of a carrying capacity under 40 tons regardless of condition. A 10-ton car is a mere trifling with transportation. Cars half that size are now pushed to the coal face in some mines of the United States, and some few steam shovels already introduced would overload a British car with dirt in one opening of its capacious mouth. These 10- and 12- and even 30- and 40-ton cars look like pigmies beside the 100-ton "hoppers" of the Norfolk & Western Ry.

A book modeled after the lines of that now being reviewed would be of remarkable benefit to the coal trade in this country—a safe and sane story to which newspaper men would instinctively turn when crises in the trade arose. Instead of building upon their fertile imaginations, they would have here a safe source of information.

The British book covers the matter well—coal and coal seams, uses of coal, the coal fields, the manner of sinking and development, the methods of mining and preparation, the by-products, the economics of the coal trade, the sale of coal, amalgamations, methods of paying wages, mine safety, mining law and inspection, unions, sliding scales, conciliation boards, abnormal places, the minimum wage act, miners' life and work, their housing, foreign trade, oil fuel and conservation. The book makes welcome reading for those who are interested in the British coal trade whether to emulate its conditions or to meet them in competition.

An Entirely New Study

PURCHASING. By C. S. Rindsfoos, president of the United States Purchasing Co., former secretary-treasurer of the Foundation Co. McGraw-Hill Book Co., Inc., 239 West 39th St., New York City. Cloth, 6x9¼ in. pp. x + 162 + 3 index; unillustrated. Price, $2.

This book on an entirely new subject appears offhand a needless attempt to make a learned study of an extremely simple matter. In the first chapter the reader is impressed most with the common sense and fine diction of the author. Later he realizes that purchasing is not merely a fine art and a branch of psychology, but a science, the more valuable of acquirement because so little known and so seldom taught.

The chapters are entitled: How To Obtain the Right Article, How To Obtain the Lowest Price, How To Obtain Prompt Delivery, Making the Purchase Conform to Fixed Policy, How To Obtain Favorable Terms, Personal Characteristics and Qualifications, Strategy, Some of the Legal Aspects of Purchasing, Departmental Organization, and Forms.

The author gives a valuable table showing the usual terms of settlement for various articles; that is, the number of days before interest begins to run and the discounts deductible for prompter payment. The reader can find out what are the customary discounts and the usual period of payment allowed and can tell just what concessions he may hope to obtain. Mr. Rindsfoos's extended experience with the Foundation Co., during which he made large purchases of material, makes this table of much merit and advantage.

The forms given at the end of the book are remarkably complete and include 15 form letters, 5 requisitions, 2 tabulations for bids, 4 catalog and price index cards and 5 orders and acceptances. Then follow contracts, builders' agreements, leasing contracts, bills of sale, general releases, bonds, vessel charters and other forms.

An interesting item relating to freight rates and their interpretation is important in the novitiate of the purchasing agent or mine superintendent because in dealing with a railroad he feels he is in the hands of a large and reliable corporation which cannot by any chance have two prices for any one service.

Many articles, especially mixed cargoes, are susceptible of different interpretations as to their proper classification. In such cases it is the custom of freight agents when in doubt to insert on the bill of lading the highest rating. They do this on the theory that it is safer to err on the side of the railroad than on that of the customer. On the other hand, if the shipper will take the trouble to consult the official classification and then make out his own bill of lading, using the name corresponding to the lowest consistent rating, the chances are that the freight agent will not change it. We will suppose a contractor wants to ship some electrical air compressors. The freight agent, who is not supposed to be a technical man, would be most likely to classify them as "electrical machinery," which goes third class. The shipper would, however, designate them on his bill of lading as "air compressors" or as "building contractor's outfit," either of which classes takes the fifth-class rate.

Some of the matters treated are as old as the Decalogue and as necessary. The purchaser will do well to read these if only to keep himself keyed up to his duties. But the book will not appeal on this ground, for everyone thinks he knows about these matters and will keep them in mind, though of course he will not. But new and bright ideas and new and bright side lights on older ideas are here in plenty, and the purchaser is not wise if he does not avail himself of them.

Coal and Coke News

Harrisburg, Penn.

Officials of the State Workmen's Insurance Fund believe that they will have a fair show of landing for the state a considerable amount of insurance of coal miners as a result of the conference held at the Capitol on Dec. 22, between the Insurance and Compensation officials and coal operators representing approximately $75,000,000 of annual pay roll.

The state officials declared that it was the intention to reinsure the State Fund against exceptional hazard and due arrangement would be made for insurance of public liability.

From the start the meeting was marked by a fire of questions and the session did not end until late in the evening. Several coal operators and attorneys and some men who were suspected of being interested in insurance companies poured broadsides at the state officials, raising many involved questions. The state announced that its rates for coal miners would be 10 per cent. below those approved by the State Insurance Fund for stock companies.

One of the chief objections the operators have against the compensation act is the method of making reports of accidents to the Department of Labor and Industry. The form as approved now requires a report of any accident in which a man loses two days, and this report covers much necessary data and requires considerable work to fill it in and takes up the time of many clerks. It is thought that a change may be made, by which the operators will make the same kind of report to the Department of Labor as is made to the Department of Mines, which is simple yet complete.

There were some questions raised at the meeting about the procedure on approval of the stock rates but it blew over and the meeting settled down to a straight talk on what the state would do in the way of making insurance of coal miners under the compensation act attractive to the operators.

The rates for the State Fund for mining with shafts, tunnels or gallaries or with drifts or slopes will be $4.18 for anthracite mines and $3.45 for bituminous mines. These rates are based on each $100 of pay roll.

Eliminating Hearing in Common Pleas Court

The State Superior Court has held that it could hear appeals from decisions of the Public Service Commission without the cases first being heard by the Common Pleas Court. Such appeals have been heard in the Dauphin County Court, sitting in this city. The decision was handed down in the cases of the West Virginia Pulp and Paper Co. the New York & Pennsylvania Co., and York Haven Co., appellants, vs. the Public Service Commission, and the Huntingdon & Broad Top Coal and Railroad Co. and the Pennsylvania Co., the Philadelphia Baltimore & Washington Railroad Co., and the West Jersey & Sea Shore Railroad Co. as intervenors.

The cases involved an increase in freight rates. The railroad companies contended that the act amending the Public Service law which permits appeals direct to the Superior Court instead of to the County Court, was unconstitutional.

The Superior Court will hear the cases on appeal next spring. When the court adjourns its present sitting it will not meet again for the hearing of cases until Feb. 29.

The effect of the decision is to uphold the act which was passed for the purpose of getting appeals direct into the Superior Court without the Dauphin County Court having anything to do with them. Over a dozen coal appeals have been pending until the West Virginia company cases could be decided.

PENNSYLVANIA

Anthracite

Pottsville—Despite the fact that the mines are experiencing one of the busiest seasons for many years button strikes still persist. Recently a thousand men were out on this account at the mines near Mt. Carmel. In addition several mines in the Panther Creek Valley have been idle from the same cause.

Eckley—The Lehigh Valley Coal Co. is making preparations to resume mining operations at this place on an extensive scale, also at Buck Mountain, where the beds were thought to have been worked out a number of years ago, but which since have been found to be still quite profitable.

Wilkes-Barre—The fire which after burning five days was thought to have been extinguished in the Red Ash mine near here recently broke out anew. The gas generated by the burning coal escaped through the ground in several instances and occupants of houses over the workings were overcome by the fumes. Twelve persons were affected in this manner and a half dozen families were compelled to abandon their homes on this account. The last report was that the fire had approached the wall dividing it from the Lehigh Valley Coal Co.'s mine, which latter company is aiding in the fight. While efforts are being made to subdue the fire by flooding it may be necessary to smother it by resorting to sealing.

The Pond Creek mine, which has been abandoned for several years, will shortly be reopened by Scranton capitalists who have organized under the name of East End Coal Co. The breaker, which was destroyed by a wind storm some time ago, will be rebuilt except that the new building will be larger than the old one.

Hazleton—A rumor recently gained considerable currency among the anthracite workers hereabouts that in order to reduce its liability under the new compensation law the Lehigh Coal and Navigation Co. had decided to discharge many of its oldest employees. In order to ascertain the truth or falicy of such a rumor a delegation of miners called upon General Manager E. M. Ludlow who informed them that no such action has been contemplated at any time.

The fire in the No. 9 Gamma slope of Pardee Bros. & Co. after a fight extending over a week is reported to have been checked. In order to combat the fire it was necessary for men to go into the mine with smoke helmets and even then a number of them were overcome with the fumes from the burning coal.

Scranton—The Lackawanna company's Manville mine near here was shut down recently due to a local strike. A number of the breaker boys demanded an increase in wages and on being refused all struck.

After six years of litigation with the Delaware & Hudson Coal Co., the heirs of George M. Hull were recently awarded a verdict of $366,000 for coal royalties, which were claimed from the defendant under a lease entered into with the coal company more than 50 years ago. Under the terms of the old lease the company was to pay for all coal above a certain size mined and marketed. Since that time the small domestic sizes have come into vogue and it was for royalty on these that the heirs brought action.

Mt. Carmel—After being entombed for 96 hr. in the No. 4 workings of the Richard Colliery, Joseph Renock was rescued alive and uninjured Dec. 24. After all hope had been abandoned by the rescuers distant rappings were heard and a few hours later Renock was pulled out through a small hole. One hundred men had worked in relays ever since Renock was confined in the mine behind a fall of hundreds of tons of culm and rock. As Renock was removed from the mine he was met by his wife and in spite of his request that he be allowed to walk home he was hurried to a hospital in an ambulance.

Bituminous

Claysville—Coal has been reached in the shaft being sunk at Coon Island at a depth of 410 ft. the coal measure at that point being about 6 ft. in thickness. It is announced that work will be rushed at this point as fast as possible and it is hoped that shipments will be made within a month. Much work remains to be done about the mine however before it will be in readiness for extensive operation.

Monongahela—Shipments of coal both by rail and water from the mines along the Monongahela River are being made at a rate which indicates that more fuel is being sent out than ever before during a corresponding period.

Casselman—A large tract of coal land on the south bank of the Casselman River has been purchased by E. E. Miller and Irwin Wolf. Preparations are reported as under way to begin developments by the construction of a mining plant.

Connellsville—A fine Christmas business for the coke operators has been somewhat retarded by shortage of labor and bad transportation facilities. Production has reached 446,000 tons per week, while shipments were 441,000 tons.

Pittsburgh—More than a million bushels of coal left the local harbor recently in charge of three tow boats owned by the Monongahela River Consolidated Coal & Coke Co. It was expected at the time these three tows cleared the harbor that others would either leave the same day or shortly afterward.

MARYLAND

Midlothian—The old Bowery mine was recently explored. It is said that the exploring party found enough abandoned coal to justify resuming operations. The Little mine has also been explored, and if the fire which has been burning in this mine can be gotten under control, this will also be worked.

WEST VIRGINIA

Fairmont—The Consolidation Coal Co. is sinking a new air shaft near the Shaver bridge. This is nearing completion and as soon as finished a concrete partition will be built to separate it into two compartments, one an air way and the other a man way. This shaft will be connected with the No. 5 mine, which is now only a short distance from the foot of the shaft. After this shaft has been completed a similar one will be sunk by the same company at Hutchinson.

Bluefield—The store of the Solvay Collieries Co., at Marytown was recently destroyed by fire which originated from an unknown cause. This fire had gained such headway before it was discovered that the store and all its contents was a complete loss. Several other smaller buildings which surrounded the company store were also burned, the total loss being estimated at between $25,000 and $30,000.

Moundsville—The Panama Mine just south of this city was recently forced to shut down on account of back water covering the mine switches where loaded cars were dropped. This mine, however, soon resumed operations, the water having receded.

Beckley—The E. E. White Coal Co. upon the first anniversary of systematized first-aid instruction opened for the benefit of its employees a fine emergency hospital. This building contains two rooms, each 15 ft. square, with cement floors, steam heat, hot and cold running water, and other conveniences. The building is one and a half stories high, the second story serving as a storage room for cots, blankets, etc., for use in case it is desired to have the patient remain in the hospital for some time after receiving treatment. This hospital is in addition to the first-aid stations maintained throughout the mines.

KENTUCKY

Frankfort—Shippers representing every business interest in the state appeared before the Kentucky Railroad Commission Tuesday, Dec 21, to protest against the new railroad-rate schedules which go into effect on all lines in the state Jan. 1. The shippers were told the Commission did not have power to act, as the increases apply only to interstate shipments to junction points from Louisville, Covington and Newport.

Whitesburg—Eastern Kentucky operators are predicting that 1916 will take rank as a banner year in the history of the developments and operations in that section of the state. The recent heavy rains have made some trouble in various places in the valleys but the damage has been repaired.

Earlington—An unusual Christmas gift is announced in resolutions recently adopted by the Board of Directors of the St. Bernard Mining Co. The building, equipment and grounds occupied by the Earlington graded and high school, valued at more than $20,000, is presented as a gift, the resolution reading in part, "for the use and benefit of the people of the town in commemoration of the memory of our beloved former president, the late John B. Atkinson, and in perpetuation of the wise and beneficent policies inaugurated by him during the many years of his constructive administration of the affairs of this company." The school, which is to be known as the John B. Atkinson Memorial School, is regarded as one of the best in Kentucky. A bronze memorial tablet in honor of the former president of the St. Bernard Mining Co. will be erected at the school.

Louisville—A number of mines in the Elk Horn and Boone's Fork fields in eastern Kentucky were forced to close down recently after being inundated by water from flooded mountain streams. A number of slides along the line of the Lexington & Eastern R.R. also was caused by the floods and traffic was blocked in many places. Repairs, however, are rapidly being made.

OHIO

Steubenville—The largest mortgage ever recorded in the county was that recently given by the Wheeling & Lake Erie Coal and Mining Co. to the Superior Savings and Trust Co., Cleveland. This consisted of 81,000 words covering 21 typewritten pages. The property covered by the mortgage is located in Mt. Pleasant, Smithfield, Warren, and Wells townships. This mortgage secures an issue of bonds amounting to $300,000.

Flushing—The St. Clair Coal Co., operating the Black Oak mines and owning a large tract of coal, has sold all of its property to the Wheeling & Lake Erie Coal and Mining Co. The consideration was not mentioned, but it is believed to be approximately $170,000, the property being considered one of the best in the county.

Bellaire—Operations were recently started on a small scale at the old Wegee mine which was recently taken over by the Pittsburgh-Superior Coal Co. About 12 men were put to work, and for the time being, all the coal mined will be dumped into barges and shipped down the river. Later, however, a switch will be run from the railroad to the mine and the coal will be shipped by rail as well as by water. At the same time a new tipple will be erected and a force of 200 miners put to work.

Columbus—Final testimony was offered recently in the Hocking Valley Ry. coal-rate case before the Utilities Commission. Proceedings in that case were started last summer by the United Mine Workers of America, but the fight has been taken over by the Sunday Creek Coal Co. The contention is that the present coal rates on the railway are far above the reasonable figure, and efforts are being made to get a rate reduction from the commission. During the next 30 days attorneys for the two contestants will prepare and file briefs and later oral arguments are to be heard, and it is expected about Mar. 1 next the case may be finally submitted to the commission for decision, but it is regarded as certain the questions involved will be taken to the Courts for final decision.

The New Pittsburgh Coal Co., through G. C. Weitzell, its president, has filed informal notice of protest against the proposed new tariff of the Hocking Valley R.R. on coal from the Nelsonville district to the lake. The letter sets forth that the proposed return to the old rate of $1 for lake coal, which the Hocking Valley seeks to reëstablish, is discriminatory, unreasonably high and relatively higher than rates of competing roads.

INDIANA

Indianapolis—John P. White, president of the United Mine Workers of America has addressed letters to operators in Indiana, Illinois, Ohio and western Pennsylvania asking them to arrange for a conference to discuss with the miners' officials the question of re-establishing the interstate agreement.

ILLINOIS

Springfield—The state mine-rescue instruction cars have been called in and mine inspectors have been notified that this service will be discontinued until further notice. The cars have heretofore been sent to mining communities to give first-aid instruction. Rescue certificates were issued to miners who took the instruction. Now the miners who want instruction will have to go to the rescue stations. Lack of money for the purpose is the reason ascribed for the withdrawal of the cars. There are rescue stations at Springfield, La Salle and Benton.

Belleville—Judgment has been entered in the Circuit Court by Judge Crow against the Missouri & Illinois Coal Co. in favor of the Willisville Coal Co. for $724.19, for 1,900 tons of coal belonging to the Willisville company, which was removed by the Missouri & Illinois company. The question of the cost of mining coal entered into the decision of the case. The judgment was based on the value of the coal less the cost of mining, hauling, hoisting and dumping.

Johnston City—This coal-mining town, with a population of 5,000, has a $15,000 post-office building which was not built by the Government. The mining and business interests contributed the money. The building was erected without governmental assistance and was turned over to the Post-Office Department ready for use. There are seven mines in the vicinity, employing upward of 1,500 men. The need of a new post-office building prompted the movement.

After twenty-one years of continuous service as superintendent and general manager of the mine of the Williamson County Coal Co., at this point, Mayor Harry Barlow has tendered his resignation to take effect Jan. 1, and announces that he will take a long-needed rest. Mr. Barlow sunk the mine and immediately following, the present company purchased the property. The company, in high appreciation of his long and valuable service, has placed his name upon its pension roll.

Staunton—The authorities of White City, between Staunton and Mt. Olive, have offered a reward of $50 for the arrest and conviction of the person or persons who poisoned the well of Theodore Helm, manager of No. 15 mine at White City. The manager's wife, on pumping water from the well, discovered that it was green. Paris green was found on the ground and a large quantity of it had been thrown in the well. Bloodhounds were used, but without result. Several families use water from the well. The motive is not known.

Marion—The new shaft of the West Virginia Coal Co., being sunk near here, struck coal recently. The air shaft was previously dug. Much of the equipment is on hand ready for installation.

MISSOURI

Bevier—Three hundred miners escaped safely Dec. 23 when fire was discovered in an underground mule stable at the Central Coal and Coke Co.'s mine No. 66. Two mules were incinerated. The property loss will amount to several thousand dollars.

COLORADO

Denver—The Young Men's Christian Association is working to carry out thoroughly, in the mining camps of the Colorado Fuel and Iron Co., the same kind of work that it has conducted on western railroads. The industrial secretary, A. Bruse Minear, has made an economic survey of the camps in the southern field. Under his direction, the Association has installed moving-picture shows, phonographs, bathing accommodations for all comers, social centers for men and women, soda-water fountains and various other apparatus in 8 camps.

MONTANA

Helena—With a shortage of coal at Duluth, and the Northwest facing a coal famine, State Coal Mine Inspector John Sanderson states that Montana has now an opportunity to open her fields of resources to the world and compete with the Eastern coals. Mines of Montana are only commencing to develop and as evidence of this, Mr. Sanderson has just received a report from one company that was not a producer last year, showing that the firm is now producing 323,000 tons yearly.

PERSONALS

Louis M. Day, of Chillicothe, Ohio, has been appointed a member of the Ohio Utilities Commission to succeed Oliver H. Hughes, who retired recently.

Frank W. Heister, Jr., assistant paymaster of the Lehigh Coal and Navigation Co., has been elected a director of the Dime Savings Bank of Lansford, Penn., one of the city's leading financial institutions.

Morgan O. Morgan, colliery superintendent of the Lehigh Coal and Navigation Co., has announced his candidacy as a delegate to the Republican National convention, with favorable prospects of his selection.

Charles A. Royce has been made northeastern sales manager of the J. Harold Thompson Co., with office in the Prudential building. He has been in Buffalo for some time in that connection, but without an office downtown.

D. Harrington of the U. S. Bureau of Mines has been appointed engineer in charge of the Bureau at Denver, Colo., to succeed James C. Roberts, who resigned, effective last month. Mr. Harrington has had a wide experience in Colorado metal mining.

J. P. White, president, and William Green, secretary-treasurer, of the United Mine Workers of America, will be in Cleveland the first week of January to discuss the wage contract and to arrange a conference to make the contract with eastern Ohio operators. It is believed the present contract will be renewed.

At a meeting of the Board of Managers of the Lehigh Coal and Navigation Co. held recently the administration of the commercial operations of the company was assigned to H. F. Baker, vice-president, effective Jan. 1, 1916. Henry H. Pease, now treasurer, was also elected secretary, in place of Mr. Baker, resigned, effective on the same date.

Charles A. Bryan was recently appointed traffic manager for the Southern district of the Republic Iron and Steel Co., succeeding W. H. Johnson, deceased. Mr. Bryan has been connected with the Republic company for the past four years in the traffic department, and for two years prior thereto was employed in a similar capacity by the Sloss-Sheffield Steel and Iron Co.

J. A. Paisley, president of the Valley Camp Coal Co., has purchased 7 ships for himself and associates. He has acted to some extent for a large ore interest, but will keep four of the ships himself. Altogether Cambria Steel Co. has purchased 7 ships, Paisley 7, other interests, 10. Deals are pending for about 20 more vessels. In all cases the ships have gone into the hands of steel or ore interests and those associated with the steel or ore business.

OBITUARY

Henry Wick, a well-known coal operator of the Youngstown, Ohio, section, died recently from pneumonia at the age of 69 years.

Stephen B. Whiting died recently at Cambridge, Mass. For 20 years Mr. Whiting was general manager of the Philadelphia & Reading Coal and Iron Co. Mr. Whiting came to Pottsville when engaged as mechanical engineer for George W. Snyder, who was the proprietor of a large iron works where now stand the upper shops of the Coal and Iron company. He later became mechanical engineer for the Coal and Iron Co., which absorbed the shops of Mr. Snyder. When the late Col. Henry Pleasants retired as manager of the Coal and Iron company, Mr. Whiting was chosen to succeed him. He was later engaged to take charge of the extensive copper mines at Calumet, Mich., and those of the Calumet & Hecla Mining Co.

TRADE CATALOGS

The Wm. Powell Co., Cincinnati, Ohio. Booklet. "White Star Valves." Illustrated, 16 pp., 3½x6 in.

C. C. Bradley & Son, Syracuse, N. Y. Circulars. "Power Hammers and Heating Forges." Illustrated.

The Scranton Pump Co., Scranton, Penn. Bulletin No. 105. "Triplex Plunger Pumps." Illustrated, 8 pp., 6x9 in.

Malcolmson Briquet Engineering Co., Chicago, Ill. Catalog. "Malcolmson Briquetting Plants." Illustrated, 26 pp., 9x11 in.

Harrison Safety Boiler Works, Philadelphia, Penn. Pamphlet. "Finding and Stopping Waste in Modern Boiler Rooms by Use of Cochrane Meters." Illustrated, 68 pp., 6x9 in.

The Richardson-Phenix Co., Milwaukee, Wis. Bulletin No. 50. "Phenix Force Feed Lubricators. Illustrated, 12 pp., 8½x11 in. Bulletin No. 60. Richardson Model M Sight Feed Oil Pump. Illustrated, 20 pp., 8½x11 in.

INDUSTRIAL NEWS

St. Louis, Mo.—The Illinois Central Railroad Co. is said to have begun storing coal at several points in Illinois, in anticipation of traffic difficulties after Jan. 1, and the possible closing of the mines on Apr. 1 next.

Buffalo, N. Y.—This section is much interested in the big gas wells lately opened at Kane, Penn., as the first natural gas used here came from Pennsylvania. Buffalo is probably the largest user of natural gas in the country.

Uniontown, Penn.—One hundred and ninety-seven acres of coal in Center and Ridgefield townships were recently sold at sheriff's sale to R. F. Hopwood, Stewart Henderson, and J. B. Adams, of Uniontown. The consideration was $2,070, or the amount of the mortgage.

Buffalo, N. Y.—The Northern Central Ry. was convicted in the U. S. district court here last week of rebating in failing to collect royalties on mining property that had been leased to an auxiliary company. The court will fix the amount of the fine on Jan. 10.

Washington, D. C.—Formal protests were filed Dec. 23 with the Interstate Commerce Commission against raising rates on coal tonnage from West Virginia to western markets. Supplemental protests will be filed later by representatives of local organizations of coal operators.

Spokane, Wash.—The Industrial Insurance Commission has decided that every coal mine operating in Washington during 1915 will be taxed 1½ per cent. of their year's payroll in order to cover approximately $75,000 in claims against the commission for the death of 31 miners at Ravensdale recently.

St. Louis, Mo.—The Williamson County Coal Co., with home office in St. Louis and operating a mine at Johnston City, Ill., has its new Illinois mine connection in operation. Shipment of the "Black Brier" coal can now be routed out of the mine via either the Illinois Central or Chicago & Eastern Illinois.

St. Louis, Mo.—The Berry Bergs Coal Co., recently announced that it has contracted for the sale of the entire tonnage of the "Tilden" mine, located at Tilden, Ill., on the Illinois Central Ry. The coal will be prepared in the sizes of 2-in. screened lump and 2-in. screenings. The daily capacity of the mine is 300 tons.

Huntington, W. Va.—Officials of the Main Island Creek Coal Co. recently contracted for the purchase of a coal tipple at a cost of from $8,000 to $10,000. Options on two other tipples which will probably be purchased later in the season, were also taken by these men. Extensive improvements are under way near Omar in the Upper Guyan Valley.

Philadelphia, Penn.—The feeling is growing here that the reduction in tidewater anthracite rates will not become effective for some months. The latest postponement by the Interstate Commerce Commission was until Jan. 1 and it is believed that the labor devolving on the railroads in preparing their tariffs to meet the order will be such as to occasion further postponement from month to month until spring.

Hazard, Ky.—The Kentucky River Power Co. is pushing ahead with its construction work and regularly receiving shipments of equipment. L. E. Woods was recently elected president of the company and has headquarters at Welch, W. Va. He is president of or interested in many important operations in this section. It is stated that the new company will supply day and night service to the Hazard Power Co.

New Orleans, La.—The voting contest conducted by the W. G. Coyle Coal Co., of this city, and which began in October, in the interest of sipsey coal, closed on Dec. 21. Contestants clipped votes from the local newspapers, and were also awarded a certificate for each barrel of coal sold. Miss M. Fatzer was awarded the 15 barrels of coal and the coal range, first prize; with Miss Julia Oser second and Miss Thelma Levy third.

Sedalia, Mo.—The Missouri, Kansas & Texas Ry. management recently advised the Sedalia Chamber of Commerce that 200 additional car builders are wanted at once in the Sedalia shops. An order has been given for the turning out of 2,500 steel underframe cars a month. The work will extend over a period of three years. The 650 men now employed in the shops are working 9 hr. daily on week days and 8 hr. on Sundays.

Denver, Colo.—Business men from Grand Junction appeared before the state public utilities commission this week to testify that the existing freight rates on coal from mines in their district to Cripple Creek are exorbitant. The complaint was brought by the Grand Junction Fuel and Mining Co. and the Palisades Fuel Co. against the Colorado Midland, the Midland Terminal and the Colorado Springs & Cripple Creek railroads.

Connellsville, Penn.—The increased demand for coal and coke and consequently greater activity of the mines has given the traffic in mine timber a considerable stimulus. There is now a larger demand for props, and prices have advanced as inquiries and orders have become more frequent. Standard split props, which were selling somewhat slowly at 10 to 11c. each some months ago, now bring 13 to 14c. each. The producers of props report a scarcity in both labor and car supply.

Morgantown, W. Va.—The affairs of the Lehigh Valley Coal Co. in Grant District were recently placed in the hands of two receivers, W. E. Glasscock and Guy B. Hartley, who were appointed under bonds of $10,000. The officers of the firm are temporarily restrained from action, delay in the payment of the defendants' payroll was an allegation made by the plaintiff, the Monongahela Engineering Co., which also claimed that the petition was filed for the purpose of protecting creditors.

Harrisburg, Penn.—In his annual report covering the mining industry of the state, both anthracite and bituminous, James Roderick, chief of the Department of Mines, calls attention to the fact that the lack of coöperation acts as a bar to coal shippers of this state securing any considerable portion of the export trade after the war. He also points out that the Pennsylvania coals have received the endorsement of the Government during the past year as being equal in quality to any other coal mined in the country.

Washington, D. C.—The United States Geological Survey recently issued its report for the year 1914 covering the coal production of the country. The figures are all compiled on the short ton of 2,000 lb. and shows that the State of Pennsylvania mined 238,804,801 tons, with a value of $347,187,695. Of this amount 90,821,507 tons were anthracite with a value of $188,181,399. The production of bituminous coal amounted to 147,983,295 tons, valued at $159,006,296. The report also states that the production of both kinds of coal in the state was less than the tonnage of 1913.

Columbus, Ohio—Ohio's coal production in 1914 was reduced to 18,736,407 tons, being approximately half of that of the previous year. The decrease in production was due to the strike in April of 1914 and the subsequent idleness of the mines. The number of miners employed was 46,965, and the average pay of each for the year was $337. Pick miners worked an average of 150 days, but loaders only 101 days. Many of these men shared their day's work with others, so that the actual full day's employment for each man would be even less than the report shows.

Scranton, Penn.—The anthracite mines throughout this district are severely handicapped by the shortage in labor. This is principally due to the fact that large numbers of the workers have returned to Europe to take part in the war and their places have not been taken by immigrants who have practically ceased to appear. The high wages paid to workers in the munition plants have also attracted a large number of men from the coal region. The principal difficulty seems to be in procuring laborers, as most of the companies report they have sufficient miners. One company advertised recently for 600 laborers with practically no response.

Harrisburg, Penn.—Representatives of 30 mining companies took part in a conference here with the officers of the State Workmen's Insurance Fund Board in reference to the operation of the new compensation law. Both the anthracite and bituminous interests were represented and it was estimated the pay-rolls of these companies reach an aggregate of $75,000,000 annually. One of the interesting facts brought out was that the State Insurance Fund would take the risks of insurance at rates averaging less than those of the regular companies. The basic rates were figured on every $100 of payroll, and for anthracite have been fixed at $4.18 and for bituminous mining $3.45.

St. Louis, Mo.—Orville Virden, city salesman of the West Virginia Coal Co., has been granted a patent on the Virden Underfeed Firing Device for stoves, ranges, furnaces, hot water heaters and boiler plants of all sizes. The advantages claimed for it are that economy is accomplished by the use of the finer grades of coal, the consumption of smoke, soot and gas, the elimination of clinkers and cinders and that the device is not hard on stoves, boilers or furnaces. The fire is replenished from below without opening the fire door. The fire is all the time on top of the coal, so that the smoke and gas must pass directly through the fire and are entirely consumed. Mr. Virden says he has been offered $10,000 for his patent.

St. Louis, Mo.—Officials of railroads operating eastward from Chicago and St. Louis report an enormous tonnage of nearly every description to the seaboard. The heavy storms of the past week or more further complicated matters and congested traffic considerably at the important gateways. Business conditions in the entire territory of the Eastern roads continues to flourish. West-bound traffic has increased and in spite of the lack of the former heavy volume of import freight is now nearly back to the normal volume of former years. Officials of Southern railroads report a substantial gain over a year ago, and for the similar period of 1913. Miscellaneous business is holding up well, and there is an increasing demand for general merchandise. Lumber is moving in especially good volume, and business in the South on the whole reflects substantial improvement in practically all lines of trade.

Washington, D. C.—Two far-reaching suits under the Sherman Anti-Trust law recently reached the Supreme Court, one involving the anthracite coal business in Pennsylvania, and the other growing out of labor troubles in the Arkansas coal field. The Government appealed from the decision of the Federal District Court in eastern Pennsylvania which sustained partially the attorney general's contention in the suit to dissolve a number of alleged illegal combinations of railroads and coal companies in the anthracite coal field. The second case was an appeal by A. S. Dowd, receiver for the Coronado Coal Co., and associated firms in Sebastian County, Ark., from the decision of the Federal District Court in Western Arkansas dismissing the receiver's suit against the United Mine Workers of America and its local unions and officers for $1,283,000, as treble damages for alleged conspiracy in combination in violation of the Sherman law.

Market Department

General Review

Increase in the anthracite circular and shippers have unlimited orders. Bituminous becomes more confused as the season advances. Seaboard demand a factor at interior points. Middle Western situation firm though quiet.

Anthracite—The rush for coal continues unabated and shippers apparently have unlimited orders on their books while the individual operators are exacting substantial premiums. The feature of the week's developments has been the new circular effective Jan. 1 putting an increase on practically all sizes. Confiscation of coal en route for locomotive use has also become a factor to be reckoned on. The demand is heavier if anything while the supplies are shorter, and shippers are making heavy cuts on requisitions, sometimes being unable to furnish any coal at all. Many large retailers with contracts for office buildings and public institutions are being exceedingly hard pressed to keep the plants supplied.

Bituminous—The situation is decidedly mixed and difficult to define clearly. Receipts are spasmodic and confined essentially to contracts while an occasional sale at panic prices is noted where a consumer is hard pressed to keep his plant going; such negotiations confuse the situation and there is much uncertainty concerning business over the next 60 to 90 days. Embargoes against rail shipments to Down East points has directed general interest to the situation there which becomes more complicated as the season advances, while further evidence of the disruption in the customary channels of trade is seen in the tentative negotiation for putting Ohio coal at Tidewater.

Exports—There has been a moderate increase in the export movement, particularly to Italian ports, in spite of the tendency to slow down over the yuletide season. There is still an abnormal accumulation at Tidewater although it is noted that some shippers have been crowded for tonnage to load steamers promptly.

The Ohio Valley—The car shortage is now having a marked effect on the trade in this section, particularly on West Virginia coal, the market for which is being materially restricted from this cause. Production has likewise been curtailed, due to the holiday cessation in operations, while the demand seems to be steadily increasing both on the steam grades and for domestic coal. The movement to seaboard is an encouraging factor in the situation, the demand in that direction tending to divert considerable tonnage from the interior market and open up new business for coals in that field.

Middle West—The domestic market has shown increased strength, while the steam grades continue to have an upward tendency. The improvement is particularly notable on fine coal, and the indications are for a strong market on these the balance of the season. In spite of warmer weather recently, the demand for the domestic grades has not eased up. The slowing down in operations over the holidays will have a beneficial effect on the market, and tend to reduce the supplies in the dealers' hands. Further orders for storage coal have also been received, which have had a beneficial effect on the market.

A Year Ago—Colder weather forces the large anthracite companies to draw on their storage piles. Bituminous trade continues heavy, with sales agents pushing hard to place the current production. Substantial improvement noted in the Middle West.

BUSINESS OPINIONS

Boston News Bureau—The more one studies the general situation the more one is convinced of the basis for the remarkable recovery and confidence which is now being shown. We hardly realize the enormous wealth which has come to this country. This is not alone the result of our tremendous foreign orders, but is legitimately due to our prolific crops, as well as to the savings of the people. There is a tendency to spend more money now, but it is spent here and consequently going into circulation here. There is a broadening every day of our domestic trade and a willingness to branch out in new undertakings. Stocks of goods are low everywhere, and must be replenished and this insures higher prices and a coming activity. This upbuilding is likely to assume great speed as we come nearer the spring.

American Wool and Cotton Reporter—Features of the wool market for the week under review include greater interest in three-eighths and quarter-blood territories and greater buying of scoured Australians on the part of the smaller dealers. Importers are receiving good prices. Domestic wools are now cheaper than foreign wools bought within the last sixty days. During the last year, importers have made handsome profits and have been able to sell their wools at a less figure than they have been able to replace them at. They will continue to do so, it is stated. Sales for the week have not been particularly large with some houses, but have been pretty well distributed over the various grades.

Marshall Field & Co.—Current wholesale distribution of dry goods shows a marked advance over the corresponding period of a year ago. The large increase in road orders—mail orders—the number of telegraphic orders from all over the country, and the increased number of customers in the market, indicate that the retail dry goods trade is having an exceptional holiday business. Orders for spring delivery show a large increase over the corresponding period of a year ago. Collections are above normal. Prices are firm.

Dry Goods Economist—Every merchant, wholesale or retail, every manufacturer, every producer can look forward to the new year with confidence and with hope. Already a decided change in the attitude of distributors is apparent. Throughout the greater part of the year retailers, in particular, pursued an extremely conservative policy, making their purchases on the smallest possible scale and taking as few chances as possible with regard to the future.

Bradstreet—A record-breaking holiday trade accompanies evidences of extraordinary activity in industrial lines, reports of light stocks almost everywhere, marked strength in grain and higher cotton prices, good collections, heavy railway traffic, smart activity in employment at relatively high wages, widespread distribution of bonuses, increased incomes from profit-sharing investments and strength in the stock market. On the other hand, wholesale trade has receded somewhat, in consonance with the season of year-end inventorying, which takes salesmen from the road and causes this branch of enterprise to temporarily mark time.

Dun—Apart from the rush in the shopping districts, there has been little in the business world to indicate that this is the holiday season. Preparations for inventorying are much less of a factor than usual and, instead of the slowing-down process characteristic of the period in most branches, commercial activities are exceptionally well sustained. Commercial failures this week are 391, against 381 last week, 372 the preceding week and 376 the corresponding week last year.

ATLANTIC SEABOARD

BOSTON

Bituminous prices still at a maximum. Georges Creek shipments very light. Situation on Pennsylvania grades complicated by embargoes. Water freights continue buoyant. Anthracite not improved.

Bituminous—While in some respects it may be said that New England is "marking time" yet receipts are very small and the mild weather is only postponing the day of reckoning that many confidently expect. The present situation is not easy to describe nor is it the kind of market one can make unlimited predictions about. Some buyer is found who is in distress for quick coal and he pays the price asked; immediately it is known and that price is the "market" until a fresh instance is heard. At the same time offerings are for delivery farther and farther off and it requires determination to buy any quantity of bituminous for shipment in February or March at present prices, based as they are on the highest

water freights this market has known in a good many years. The newspapers, however, are giving publicity to all the serious phases of the car, labor and boat shortages.

Retarded much by bad weather, receipts from Hampton Roads are coming forward only spasmodically, but not in enough volume to affect spot prices. A very large proportion of this coal is for application to season contracts any way and aside from small lots on cars at distributing points most of the high prices quoted on Pocahontas and New River have been for coal to be shipped. Meanwhile the f.o.b. price has not changed and those fortunate enough to have any free coal and at the same time have barge or steam transportation available can obtain some handsome profits. Seven dollars is still heard as a price for spot coal at Providence or Boston but it is possible that the number of boats recently chartered will later have a tendency to ease off prices, at least for a short interval. Much depends on weather, on labor news from the regions, and on the car movement all-rail.

Water Freights—Three dollars and fifty cents is understood to have been paid from Hampton Roads to Boston, and $3.25 to Providence. So keen is the scramble for tonnage that charters are made at rates as high as $3 where the boats secured cannot possibly be available until February. So long, however, as there is no end in sight all the boats offering will be snapped up by buyers eager to get coal forward or shippers anxious either to make good on delivered price contracts or to speculate on what some of them regard as a buoyant market.

Anthracite—No improvement can be noted in the supplies of hard coal coming forward. Another gale, Dec. 26, took out another half-week from the movement of tows, and all the anthracite companies are now suffering from irregular car-supply. Failure to get normal supplies of bituminous has caused some of the railroads to confiscate anthracite en route. Stove and chestnut are now scarce at all the piers. Providence, R. I., retail prices were advanced 50c. on Dec. 27.

Quotations on bituminous, f.o.b. loading ports at points designated, are about as follows:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$3.75@4.50	$4.00@4.75	.....	$2.50@3.25
Cambrias and Somersets	4.10@4.50	4.30@4.75	.....	2.85@3.25
Georges Creek	.....	.....	.....	.....

Pocahontas and New River prices, on cars Boston, are $6@6.25; Providence, $6@6.50; for cargo lots up to $7; and f.o.b. loading ports at Hampton Roads, $2.85.

NEW YORK

Anthracite situation serious and supply short. Prices at full circular and premiums reported on some sizes. Steam coals scarce. Bituminous tightening and serious consequences feared. Prices high with no relief in sight.

Anthracite—The hard coal situation is serious. There is comparatively little coal at Tidewater and with no improvement in transportation conditions in sight there is no immediate prospect of betterment. Demand continues heavy and if anything stronger than last week. Instead of salesmen soliciting orders it is necessary to either reduce the tonnages asked for or refuse them altogether. Dealers are putting forth every effort to keep their customers supplied but find this difficult. The mines are working little better than half time owing to car congestion.

The steam sizes are tighter than a week ago. Demand for pea coal is heavy. All buckwheat grades are scarce and are being quoted up to 35c. above regular prices. Many of the large retail dealers who have contracts for the office buildings and public institutions are hard pressed for supplies.

Current quotations, f.o.b. gross ton follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.30@5.30	5.35	$5.35@5.35
Stove	5.30	5.30@5.30	5.35	5.35@5.35
Chestnut	5.55	5.55@5.55	5.60	5.55@5.60
Pea	3.50	3.45@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.45@2.75	2.80	2.45@2.80
Rice	2.25	1.95@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—The soft-coal situation at Tidewater is tense. Demand is on the increase and with no change in the car situation there is less coal on hand than a week ago. Conditions are serious and it is the opinion of many dealers they will become worse before they are better. There has been no material change in f.o.b. quotations for the various grades but harbor quotations are noted ranging from $4.50 to $4.65. The embargo placed on South Amboy several days ago was partially lifted early in the week. The storm of last Saturday night played havoc with more than a score of boats tied up at South Amboy and other docks and many shippers found themselves in serious trouble the first part of the week. Boat rates are on the increase, harbor prices ranging from 40 to 45c.

Demand from New England has fallen off so far as New York shippers are concerned, most of the coal going forward direct from the mines, with a few cargoes from Southern ports to Boston. Nevertheless the local dealers were visited by many New England buyers during the week. Line demand is active and quotations are a trifle better than at Tidewater.

Current quotations, f.o.b. gross tons, Tidewater follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$4.30@4.55	$4.30@4.55	$4.30@4.55	$2.75@3.00
Georges Creek Tyson	4.05@4.30	4.05@4.30	4.05@4.30	2.50@2.75
Clearfield:				
Medium	4.05@4.15	4.05@4.15	.....	2.50@2.60
Ordinary	3.90@3.95	3.90@3.95	.....	2.35@2.40
Broad Top Mountain	.....	.....	.....	2.25@2.50
Cambria County:				
South Forks	4.05@4.30	.....	.....	2.50@2.75
Nanty Glo	4.05@4.30	.....	.....	2.50@2.75
Barnesboro	4.05@4.20	.....	.....	2.50@2.65
Somerset County:				
Quemahoning	.....	4.05@4.30	4.05@4.30	2.50@2.75
Medium	4.00@4.15	4.00@4.15	4.00@4.15	2.50@2.65
Latrobe	3.95@4.15	.....	.....	2.40@2.60
Greensburg	3.95@4.15	.....	.....	2.40@2.60
Westmoreland	3.75@3.85	.....	.....	2.00@2.10
West Virginia Fairmont ¾		3.80@3.90	3.80@3.90	2.00@2.10
Fairmont mine-run	.....	3.80@3.90	3.80@3.90	2.00@2.10
Steam	.....	3.80@3.95	3.80@3.95	2.20@2.40
Western Maryland	.....	3.80@3.95	3.80@3.95	2.25@2.40

PHILADELPHIA

Anthracite heavily bought, and many orders unfilled. Chestnut continues in the lead, though all sizes are readily absorbed. New price circular Jan. 1. Demand for bituminous unabated. New England market the feature. Prices move upward.

Anthracite—The strong demand for anthracite continues, without the least slowing up on any size. The books of the shippers, especially the big companies, carry apparently unlimited orders. Dealers fearing a greater shortage, have probably been somewhat reckless in ordering, but the fact remains that every car shipped finds a ready buyer. The embargo on coal to Port Liberty and Port Reading has had a beneficial effect on the Philadelphia market and as a consequence there has been no real shortage this week. The fact that one of the big companies called upon their trade to take box cars, an almost unheard of request, served to impress the buyers as to the difficulty in getting supplies. The newspapers have recently devoted much space to the coal shortage and this has served to impress upon the larger steam consumers the necessity for storing, particularly in view of the advance in price the first of the year and the anticipated trouble at the mines on Apr. 1.

Demand for broken coal has increased considerably, especially on contract business, calling for large tonnages, which are far from being filled. Even though it is certain the price will be increased there is no doubt that the demand will be even greater than now, as all gas companies are endeavoring to stock heavily to meet a possible suspension. If there is any weak size it is egg, though little trouble is found in disposing of all produced at $3.75 and stove is strong at the full circular, with the demand increasing; there is practically none of this latter size in storage and the large buyers realizing that fact are endeavoring to protect themselves.

Chestnut, the once despised size, continues the leader, due probably to the fact that the householder has at last awakened to the necessity of stocking and as a consequence the dealers are unable to accumulate any appreciable surplus. Some storage chestnut arrived this week and from now on this will be increased. Outside of the car supply interferring there will be no serious shortage of this size for some time on account of the large quantity stored above ground. Pea coal has been bought the past few weeks by the dealers whether they had any room for it or not in their yards. They appreciate a bargain and simply advised the companies to ship, being willing to take a chance on a few days' car service if necessary. The demand for the steam coals continues even stronger, due principally to the fact that the railroads are confiscating large quantities for engine fuel to mix with what bituminous coal they are able to procure.

Prices per gross ton, f.o.b. cars at mines for line shipments and f.o.b. Port Richmond for tide shipments, are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.50	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.25

Bituminous—The rush to get bituminous continues unabated. This week interest suddenly shifted to the New England market, although local consumers continue clamorous for coal. In their anxiety to get fuel the New England buyers are paying a shade better than any other market at the moment. The embargo against that territory the early part of the week was partially lifted later, especially at Port Reading, where the greatest volume of tide fuel loads for

Down East. Prices continued to advance this week, although the changes were not so marked. For the very highest quality of coal the $3 price is had in occasional instances, while quotations ranging from $2.50 to $2.85 are common, shading down to $1.60 and $1.65 for slack.

Georges Creek Big Vein..	$2.85@3.00	Fairmont gas, ¾	$1.90@2.00
South Fork Miller Vein..	2.75@2.85	Fairmont gas, mine-run..	1.75@1.85
Clearfield (ordinary).....	2.60@2.75	Fairmont gas, slack.....	1.60@1.75
Somerset (ordinary).....	2.60@2.75	Fairmont lump, ordinary.	1.85@1.95
West Va. Freeport.....	2.50@2.60	Fairmont mine-run.....	1.75@1.80
		Fairmont slack.....	1.60@1.75

BALTIMORE

Better car supply makes the market a trifle easier, but prices still range high. Consumers short in many instances. Exports light.

After weeks of a car shortage the Christmas holiday period allowed the railroads to catch up somewhat, and Monday last saw a full supply in both the Somerset and Fairmont districts. Tuesday saw much coal moving to tide and other terminals, and with a New Year layoff coming, and light mine production between the holidays, the congestion was substantially improved. A feature that tends to stiffen the trade, even in the face of better movement, is that consumers' supplies are getting steadily lower.

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$3.00	$4.18	Ordinary mine run	$1.75	$3.23
Geo. Crk. Tyson...	2.50	3.68	Ordinary ¾.....	1.90	3.38
Clearfield.....	2.50	3.68	Ordinary slack....	1.65	3.13
South Fork.....	2.50	3.68	Low sulphur mine-run.....	Out of market	
Latrobe.....	2.40	3.58	Low sulphur ¾....	Out of market	
Somerset (best)...	2.50	3.68	Low sulphur slack.....	Out of market	
Somerset (good)...	2.40	3.58			
Quemahoning.....	2.50	3.68			
Freeport.....	2.35	3.53			
Miller Vein.....	2.50	3.68			

* F. o. b., outside Capes.

HAMPTON ROADS

Movement to Italy shows improvement. Prices unchanged. Demand for spot coal light.

The dumpings at Hampton Roads piers for the week have shown some improvement over previous week's business, even though the piers have worked only five days. A large number of cargoes have been loaded for the various Italian ports and there has also been a fairly large movement to Cuban ports with smaller cargoes to St. Georges, Bermuda, Surinam, D. G., Vera Cruz, Mexico, and Pernambuco, Brazil. The largest single cargo of the week went to Cristobal and was loaded into the Collier "Ulysses." This cargo amounted to 12,000 tons cargo and about 1,100 tons of bunker coal. A number of the steamers clearing for Italian ports have taken a small quantity of coke and some small parcels of general cargo.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Nov. 27	Dec. 4	Dec. 11	Dec. 18	Dec. 25
Norfolk & Western....	118,065	116,450	87,726	104,942	162,494
Chesapeake & Ohio....	93,924	81 875	70,535	55,503	96,620
Virginian.....	54,591	41,386	52,247	61,728	.....
Totals.....	266,580	239,711	210,508	222,173	.....

Ocean Charters, Clearances and Freights

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Dec. 24:

NORFOLK

Vessel	Destination	Tons
Juno[3]	Genoa	4,950
Mar Terso[2]	Italian	3,965
Wimborne[3]		8,775
Sicanin[2]	Naples	5,300
Francesco[2]	Italian	3,440
McCurdy	Surinam	954
August[2]	Genoa	8,871
Tea[3]	Italian	7,100
Europa[9]	Vera Cruz	1,900
Radcliff[3]	Genoa	8,650
Manson[8]	Pernambuco	2,393
Nordland[7]	Manzanillo	1,518
Accame[2]	Leghorn	3,834
Rosalia[2]	Genoa	6,455
Lombarda[2]	Genoa	5,523
Ulysses[6]	Cristobal	12,000
American[2]	St. Georges	3,000
Falk[5]	Havana	2,760

NEWPORT NEWS

Vessel	Destination	Tons
Nolisment[4]		7,578
American[1]	Havana	7,300
Progress 3rd[1]	Havana	5,750
Maraval[1]		1,520
Bay View[4]	Havana	2,325
Wellington[1]	Havana	2,041
McKinstrey		2,800

PHILADELPHIA

Hermod	France	
Gledhow	Montevideo	
Alf	Honduras	

BALTIMORE

Garabaldi	Italy	1,800
Gov. Powers	Porto Rico	2,615

[1] Berwind-White. [2] Pocahontas Fuel Co. [3] Flat Top Fuel Co. [4] C. H. Sprague & Son. [5] New River Coal Co. [6] W. C. Atwater & Co. [7] Castner, Curran & Bullitt, Inc. [8] C. & O. Coal and Coke Co. [9] Baker Whiteley.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
B. C. French	Porto Rico		
Ponhook	Halifax		2.50
F. Creadick	Cordonak		

ATLANTIC RANGE

Modive	San Domingo		
F. B. Deleno	San Domingo		

VIRGINIA

Vessel	To	Tons	Rate
Spithead	Port Militar		13.72
E. Ann	Bermuda		
Progress III	Havana	2,224	
Gantoese	River Plata		.55
Josephine	Para		
C. K. Scull	Para		

OCEAN FREIGHTS

As is customary at this season, but little chartering is being completed and this year it is even less than usual, owing to the great scarcity of tonnage. The British, Italian and Greek Governments are requisitioning about all of their steamers, which is making it more and more difficult to arrange charters even at recently quoted rates. Notwithstanding this, there are always a few steamers available for export coal. The last charters for export coal were at $13.48 to Port Militar; $13.20 to Buenos Aires or Montevideo; $5 to Bermuda, and $4.75 to Windward Island ports.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana.....	$3.00@3.25	Bermuda.....	$5.00
Cardenas or Sagua.....	4.00	Vera Cruz	5.50@ 6 00
Cienfuegos.....	3 75@4.00	Tampico.....	5.50@ 6 00
Port au Spain, Trinidad.	4.75@5.00	Rio.....	12.00@12 60
St. Lucia.....	4 75@5.00	Santos*	12 00@13 20
St. Thomas.....	4.25@4.50	Montevideo.....	12.60@13.20
Barbados.....	4.75@5.00	Buenos Aires or La Plata†	12.60@13.20
Kingston.....	4.25@4.50	Rosario.....	13.20@14.42
Curacao.....	4.50	West Coast of Italy.....	22.80@24.00
Santiago.....	4.25@4.50	Barcelona**.....	21.60
Guantanamo.....	4.25@4.50	Valparaiso or Callao....	12.00@13.00
Demerara.....	6.50@7.00	Marseilles.....	21.60@22.80

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

OHIO VALLEY

COLUMBUS

Domestic trade continues to improve. Steam business is active and price list well maintained. Future prospects continue bright.

The best feature of the trade is the demand for steam tonnage, which is increasing right along. Factories making war munitions, iron and steel products and general merchandise are gradually expanding and their fuel requirements are larger. One of the results of this is a marked scarcity in the small sizes, which are now quoted near the dollar mark.

Production in Ohio fields was curtailed the past week by the intervention of a holiday. There was a good production reported for the first part of the week, especially in eastern Ohio and Pomeroy Bend fields. The domestic fields have also been quite active so far as production is concerned.

Prices in Ohio fields, f.o.b. mines, per short ton, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump.....	$1.60	$1.65	.....	.....
Inch and a quarter.....	1.50	1.50	$1.35	$1.50
Three-quarter-inch.....	1.35	1.40	.....	1.35
Nut.....	1.25	1.30	.....	1.25
Mine-run.....	1.15	1.20	1.05	1.10
Nut, pea and slack.....	.90	.95	.80	.80
Coarse slack.....	.80	.85	.70	.70

CINCINNATI

Market duller, although prices are firm. Steam business improving.

Comparatively mild weather, coupled with the fact that the retail trade seems to be stocked up with the cheap coal bought last summer, has reduced business to a low ebb, although prices have not suffered materially. The market is maintained by the continued car shortage, three days a week being about the average run at the mines, and if it were not for this it is difficult to say what would happen. The heavy movement to the seaboard continues, but so far this has not helped the interior markets to any great extent. Nut and slack are about the strongest factors in the market, due to the improved industrial situation, the extraordinary activity of the steel trade and limited production of the prepared grades. Mine-run is fairly strong.

LOUISVILLE

Rather a brisk tone was displayed by the Kentucky market during the week. Steam coals are in good demand, nut and slack being higher and stronger and scarce, especially at Louisville. Prices during the week have been per long ton, f.o.b. mines, around $1.75 and $1.85 for block, $1.60 and $1.70 for 2½-in. block and lump; $1.35 and $1.45 for egg and 80 to 85c. for screenings.

DETROIT

Buying of steam coal continues more active. Cold weather and heavy snowfall stimulate the domestic market. Chestnut the strongest of the anthracite sizes. Shippers seek vessel capacity for 1916.

Bituminous—Regularity of buying is still a feature of the local steam-coal trade. Renewal orders compensate in large degree for the small tonnages covered. Small sizes continue in more active demand than other coal and some of the shippers find it is difficult to obtain enough small coal for requirements.

A heavy snowfall, followed by a considerable drop in temperature, has given new strength to domestic coal and buying was quite active during the early part of the week. Consignment stock is plentiful, but with present market conditions, not very much coal is forced on sale at cut prices by accruing demurrage. Prices in general remain steady and rather firm for direct shipment.

Anthracite—Little activity appears in the market for anthracite, with the exception of chestnut, the supply of which seems to be insufficient. Premiums of 25c. a ton are being paid on chestnut and dealers are experiencing delay in getting delivery.

Lake Trade—Shippers of coal by the Lake route are making an effort to close carrying contracts for next season. As ore shippers and furnace interests have been taking nearly all available carriers that were not aligned with ore interests, this has diminished the number of vessels that can be had for use in the coal trade next year and competition among coal shippers is becoming active. Some contracts are reported to have been made for delivery of coal at Lake Superior ports on a basis of 30c. a ton, the same freight rate that has prevailed for two years.

DULUTH

Coal movement rather sluggish. Weather continues mild. Navigation closes for the season.

Mild weather combined with the holiday season has caused a rather light inquiry for coal during the past week, especially in the domestic and retail trade. Dealers find that it is next to impossible to interest the average householder in the matter of his fuel requirements and only the direst necessity will induce him to place an order. The last boat of the season arrived during the week and navigation has closed for the year. Prices remain firm and steady but no advances have as yet been announced. Quotations are as follows, per short ton, f.o.b. cars Duluth docks:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run	3.10	3.10	3.10	3.25	3.25
Egg, stove and nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.75	2.55

The movement of anthracite during the past week has been rather slow, dealers and retailers not showing any disposition to load up with any more coal than is absolutely necessary, the public being almost entirely out of the market at the present time. Quotations per short ton, f.o.b. cars at Duluth docks, are as follows: Nut, $7.10; egg and stove, $6.85; pea, $5.55, and buckwheat, $4.

MIDDLE WESTERN

GENERAL REVIEW

Domestic trade stimulated by seasonable weather. Steam grades strong at higher prices. Smokeless coals show recovery. Anthracite demand improved.

All grades of coal are moving in good volume and the new year is faced with confidence in all quarters. The domestic market has shown greater strength, while steam grades still show an upward trend. Screenings are increasingly scarce and continue to show an advancing tendency despite ready sales of lump. Indications are that fine coals will be strong the balance of the season. Smokeless grades are in much better position, and the effects of the recent glut of Lake shipments thrown into the Western markets have about disappeared.

CHICAGO

Shipments of southern Illinois domestic sizes increased. All Indiana coals brisk. Steam sizes steadily taken at higher prices. Smokeless situation much improved.

Increased demand for domestic sizes has cleaned up the surplus at the Franklin County mines, and the market for all sizes is quite strong. Screenings maintain their firm position, and the prospects are that the demand will soon outrun the supply. The ruling price is $1.75 for southern Illinois domestic lump, egg, No. 1 washed and No. 1 nut, and but little coal is being sold this week under that figure. Steam sizes from Franklin County are in stiff demand, and screenings from Saline County are exceptionally strong. Screenings, pea and nut sizes continue to advance, and buyers are asking for all the tonnage obtainable at prevailing quotations.

More railroad shipments are going forward for storage from central Illinois mines than domestic sizes. Screenings are somewhat stronger, ranging around 75c.

A recovery has occurred in the smokeless market, and the circular price of $1.40 for mine-run has been strictly adhered to. Except in a few instances the new established prices for lump and egg have been followed. Splint lump was not affected by the recent slump in smokeless prices, which have been firmly held at from $1.50 to $1.60.

The Hocking market has gained strength during the past week, and domestic lump has been firmly held at $1.75 with only a small tonnage available. It is reported that railroad requirements, which are heavy, are obtaining preference at the mines.

Steam-coal demands on Kentucky mines are in excess of production, largely due to the pressure of orders from industrial sources. Prices are showing a much higher range for steam sizes. Nut and slack are particularly strong. Domestic coals are in plentiful supply at a wide range of quotations.

Lately anthracite has been responding better than previously, owing to improved conditions generally. Stove and egg are somewhat sluggish, while chestnut is finding a steady market with the demand slightly above the supply. In some instances orders for chestnut are not filled unless the buyer takes some of the larger sizes also. Circular prices for anthracite are generally maintained.

Quotations in the Chicago market are as follows, per ton f.o.b. mines:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.60@1.75	$1.50@1.65	$1.50@1.65	$1.50@1.65	$1.50@1.60
Steam lump	1.35	1.25@1.35	1.20@1.30	1.20@1.30	1.25@1.35
2½ and 3-in. lump	....	....	1.35@1.40	....	1.35@1.40
1¼-in. lump	....	....	1.30@1.35	1.25@1.35	1.25
Egg	1.60@1.75	1.50@1.65	1.15@1.25	1.10@1.25	1.15@1.30
Nut	1.60@1.75	1.50@1.65	1.00@1.10	.95@1.15	1.00@1.10
No. 1 washed	1.75	....	1.50	....	....
No. 2 washed	1.40@1.50	....	1.40	....	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.50	....	....	....	....
Mine-run	1.10@1.15	1.05@1.10	.85@1.00	.95@1.05	.85@1.10
Screenings	.80@ .85	.75@ .80	.75@ .85	.70@ .85	.75@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.50@1.75	$1.75@2.40	$2.00@2.25	$2.00@2.25	$1.60@1.75
1¼-in. lump	1.30@1.35	....	....	....	1.50
Egg	1.60@1.75	1.45@2.00	1.85@2.25	2.00@2.25	1.10@1.25
Nut	....	1.35@1.60	....	....	1.00@1.10
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.50	....	....	....	....
Mine-run	1.15	1.10@1.15	1.40	1.40	1.15@1.25
Screenings	.80@ .85	.90	....	....	.80@ .90

Kanawha splints hp., $1.50@1.60.

ST. LOUIS

Screenings stronger. Demand good. Domestic sizes quiet. Steam grades more active.

From a slight reaction in the first days of the week screenings have recovered with added strength and an increase of 10c. per ton on figures of previous week. A brisk demand exists in anticipation of light mining operations over the holiday period. Domestic movement is below normal owing to the unusually high temperatures prevailing for this season. Industrial consumption continues on the upward trend, increasing with each week. Additional calls for storage coal have materially aided in the present tonnage movement. Prices for the larger sizes remained unchanged.

Quotations per net ton, f.o.b. cars at mines, are as follows:

	Williamson and Franklin	Staunton and Mt. Olive	Montgomery Co.	Intermediate	Standard
8 in. lump				$1.25	$1.10 @ 1.15
6 in. lump	$1.50	$1.25	$1.25	1.25	1.10 @ 1.15
3 in. lump	1.40	1.15		1.25	
2 in. lump	1.35	1.15		1.20	.90 @ 1.00
1½ in. lump	1.30		1.10	1.10	.90 @ 1.10
6x3 in. egg	1.40			1.25	1.00 @ 1.10
6x2 in. egg			1.10	1.10	.85 @ .90
6x1½ in. egg	1.30				
No. 1 nut	1.20			1.10	.90 @ 1.00
No. 2 nut	1.10			.95	.85 @ .90
Mine run	1.10	1.00	1.05	1.05	.85 @ .90
Screenings	.80	.75	.75	.75	.70 @ .75
No. 1 washed egg	1.50	1.40		1.40	1.40
No 2 washed nut	1.35	1.25		1.25	1.25
No. 3 washed nut	1.25	1.15		1.15	1.15
No. 4 washed pea	1.25	1.00		1.00	1.00
No. 5 washed slack	.80	.70		.70	.70

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

✚**1835—Philadelphia, Penn.**—The quantities and kinds of coal to be delivered on this contract (Vol. 8, p. 1089), which provides for furnishing the City of Philadelphia with coal are as follows:

Egg: City delivery, 4,000 tons; for boats at Richmond Coal Piers, 2,500 tons; house of correction, Holmesburg, 3,000 tons; charities, 34th and Pine Streets, 200 tons.

Stove: City Delivery, 4,000 tons; Municipal Hospital, 150 tons; 34th and Pine St., 400 tons; Byberry, 500 tons; Holmesburg, 500 tons.

Nut: City Delivery, 500 tons.

Pea: City Delivery, 900 tons each of grades Nos. 1, 2 and 3. Balance, all No. 3: Spring Garden, P. S., 250 tons; Belmont, P. S., 2,000 tons; Georges Hill, P. S., 750 tons; Belmont Filters, 1,200 tons; Queen Lane Filters, 1,500 tons; Roxborough Auxiliary, 2,500 tons; Wentz Farm, 600 tons; Mingo Creek, P. S., 700 tons.

Buckwheat: City Hall, 16,000 tons; Municipal Hospital, 10,000 tons; Museums, 34th St. and Vintage Ave., 3,000 tons; Charities, 34th & Pine St., 16,000 tons; Home for Indigent, Holmesburg, 5,000 tons; Brown's Farm, 500 tons; House of Correction, Holmesburg, 5,000 tons; Belmont P. S., 6,000 tons; Georges Hill P. S., 750 tons; Belmont Filters, 500 tons; Queen Lane P. S., 7,500 tons; Queen Lane Filters, 500 tons; Roxborough Auxiliary, 24,500 tons; Wentz Farm, 1,200 tons; Pennypack Sewage Disposal Station, 450 tons.

Rice: Belmont P. S., 8,000 tons; Queen Lane P. S., 1,000 tons.

Barley: Belmont P. S., 30,000 tons; Queen Lane P. S., 22,000 tons.

Bituminous Westmoreland Lump: City Delivery, 200 tons; Byberry 300 tons.

Bituminous: Shawmont P. S., 25,000 tons; Lardner's Point, 55,000 tons; Torresdale Filters, 30,000 tons; Ice Boats and Dredges, 4,000 tons; Gas Coal, House Correction, 7,000 tons.

Address Dir. Herman Loeb, Dept. of Supplies, City Hall, Philadelphia, Penn.

New Business

Volume and page number in parenthesis at the end of an item indicate where the previous announcement, bids and awards on that contract may be found.

1848—Chicago, Ill.—The Calumet Cereal Co. at this place will contract for its annual fuel requirements, involving about 25 tons of Illinois screenings per day, on Jan. 5. Address Pur. Agt. Metzger, Calumet Cereal Co., 186 West Washington St., Chicago, Ill.

1849—Chicago, Ill.—The Price Baking Powder Co. is in the market for its annual fuel requirements, involving approximately one car of Illinois or Indiana mine-run, lump or No. 2 nut per month. Address Pur. Agt. W. B. Moore, Price Baking Powder Co., Chicago, Ill.

✚**1850—Philadelphia, Penn.**—Bids were received until 11 a.m., Dec. 29, for furnishing the Commissioners of Fairmont Park with coal as may be required during the ensuing year. Address Ch. Engr. Jesse T. Vogdes, Philadelphia, Penn.

1851—Chicago, Ill.—The Standard Brewing Co. is receiving quotations covering their weekly requirements, involving about four cars of Indiana screenings, for immediate shipment. Address Pur. Agt. E. P. Dewes, Standard Brewing Co., 1225 S. Campbell St., Chicago, Ill.

1852—Chicago, Ill.—The Kee & Chappell Dairy Co. will purchase its requirements, involving about five cars per month of Illinois screenings and five cars of 6-in. lump, in the open market. Address Purchasing Agent, Kee & Chappell Dairy Co., 1101 North Franklin St., Chicago, Ill.

✚**1853—Jersey City, N. J.**—The Hudson County Board of Commissioners will receive bids until 11 a.m., Jan. 5, for furnishing approximately 2,500 gross tons of the best quality of pea coal, to be delivered at the power house at Secaucus. Address Clk. John C. Sweeney, Hudson County Boulevard Comrs., Jersey City, N. J. (No. 93, Vol. 7, pp. 446, 488, 318.)

1854—Chicago, Ill.—Wilder & Co. at this place will purchase on Feb. 1 approximately 37 to 40 cars of Illinois or Indiana screenings to cover their normal requirements. Address Purchasing Agent, Wilder & Co., 228 West Lake Road, Chicago, Ill.

1855—Chicago, Ill.—The Calumet Baking Powder Co. will confine its purchases, involving approximately 800 tons of Franklin County No. 1 lump per annum, to the open market. Address Pur. Agt. Dr. Bryan, Calumet Baking Powder Co., 4100 Filmore St., Chicago, Ill.

1856—New Orleans, La.—The Cloverland Dairy Co. will be in the market about Feb. 1 for its annual fuel requirements, involving approximately 800 tons of screenings or mine-run. Deliveries are made at the rate of about 65 tons per week. Address Ch. Engr. W. Osderterberg, Cloverland Dairy Co., New Orleans, La.

1857—Chicago, Ill.—The Keeley Brewing Co. is confining its purchases, amounting to about one car of Illinois screenings per day, to the open market, and is now receiving quotation on this business. Address Pur. Agt. H. W. Tolby, Keeley Brewing Co., 516 East 28th St., Chicago, Ill.

1858—Chicago, Ill.—Cataract Refining and Manufacturing Co. will confine its purchases, involving approximately 150 tons of Illinois egg coal, to the open market. Address Pur. Agt. J. J. Mills, Cataract Refining and Manufacturing Co., West 66th St. and 59th Ave., Chicago, Ill.

1859—Detroit, Mich.—Jewett, Bigelow & Brooks are negotiating for the purchase of between 3,000 and 5,000 tons per month of West Virginia mine-run coal, to be delivered between the period of Jan. 1 and July 1 of the current year. Address Purchasing Agent, Jewett, Bigelow & Brooks, Detroit, Mich.

1860—Columbus, Ohio—The John M. Taylor Coal Co., at this place, is in the market for a limited tonnage of mine-run, egg, three-quarter lump, nut and slack coal. Address Pres. John M. Taylor, The John M. Taylor Coal Co., Columbus, Ohio.

1861—Wyandotte, Mich.—Eberts Brothers Co., at this place, is in the market for 500 tons of West Virginia nut and slack coal for immediate delivery. Address Harry Eberts, Eberts Bros. Co., Wyandotte, Mich.

✚**1862—Red Bank, N. J.**—The City Government at this place will receive bids until 8 p.m., Jan. 3, for furnishing and delivering between 675 and 1,000 tons of white-ash pea coal for use at the Water-Works during the ensuing year. Three-fourths of the coal is to be delivered before Apr. 1, and the balance may be delivered at any time before Oct. 1. Quotations should be made f.o.b. cars at the mine, and f.o.b. at the Water-Works at Red Bank. Address Borough Clk. A. C. Harrison, Borough Hall, Red Bank, N. J.

1863—Bellefontaine, Ohio—Bids were received until noon, Dec. 29, for furnishing the City Water-Works and Electric-Light Plant with approximately 1,200 tons of nut, pea and slack coal, deliveries to be concluded June 30. Bids should be made f.o.b. Bellefontaine, Ohio, and must be accompanied by a certified check for $100. Address Clk. Vance R. Horn, Pub. Service Dept., Bellefontaine, Ohio. (No. 74, Vol. 7, p. 275.)

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

1732—Lima, Ohio—This contract (p. 999), which provides for furnishing the Solar Refining Co. with approximately 75,000 tons of mine-run nut and slack coal, has been awarded to the **Cabin Creek Consolidated Coal Co.** Address Pres. J. G. Neubauer, Solar Refining Co., Lima, Ohio.

1744—St. Louis, Mo.—This contract (p. 999), which provides for furnishing the Wilson Stove Manufacturing Co. with approximately 80 tons of 2-in. screened lump coal per month, has been awarded to the **Lumaghi Coal Co.,** on its "Cantine" coal. The contract expires on Mar. 31, 1917. Address Pur. Agt. S. H. Long, the Wilson Stove Manufacturing Co., St. Louis, Mo.